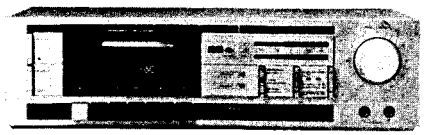
PIONEER®

016

Service Manual

CIRCUIT & MECHANISM DESCRIPTIONS
REPAIR & ADJUSTMENTS



ORDER NO.
ARP-471-0

STEREO CASSETTE TAPE DECK

Shown in this photo is Model CT-501.

CT-501
CT-450
CT-405

- CT-450 and CT-405 are the same as the CT-501 except for the design (color) only.
- Models CT-501, CT-450 and CT-405 come in versions distinguished as follows:

Type	Applicable Model			Power Requirement	Destination
	CT-501	CT-450	CT-405		
KU	O	O	O	AC120V only	U.S.A.
KC	O	–	–	AC120V only	Canada
HEM	–	O	–	AC220V (240V*)	European continent
HB	–	O	–	AC240V (220V*)	United Kingdom

*Change the primary wiring of the power transformer.

- This service manual is applicable to the KU, HEM and HB types. As to the HEM and HB types, please refer to pages 46 ~ 47. As to the other types, please refer to the additional service manual.
- The tape transport mechanism for CT-501 is the same as that for CT-301.
- As to the mechanism descriptions, please refer to the CT-301/CT-350 service manual (ARP-513).
- Ce manuel d'instruction se refère au mode de réglage, en français.
- Esta manual de servicio trata del métoto de ajuste escrito en español.

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1. SPECIFICATIONS

System . . . . . 4 track, 2-channel stereo
Heads . . . . . "Hard Permalloy" recording/playback head x 1
"Ferrite" erasing head x 1
Motor . . . . . DC servo motor x 1
Wow and Flutter . . . . . No more than 0.06% (WRMS)
No more than ±0.18% (DIN)
Fast Winding Time . . . . Approximately 110 seconds (C-60 tape)
Frequency Response
-20dB recording:
Normal tape . . . . . 35 to 13000Hz
Chrome tape . . . . . 35 to 14000Hz
Metal tape . . . . . 35 to 15000Hz
Signal-to-Noise Ratio
Dolby NR OFF . . . . . More than 57dB
Noise Reduction Effect
Dolby B-type NR ON . . . . . More than 10dB (at 5kHz)
Dolby C-type NR ON . . . . . More than 19dB (at 5kHz)
Harmonic Distortion . . . . . No more than 1.5% (0dB)
Input
(Sensitivity)
MIC (L, R) . . . . . 0.3mV, 6mm diam. jack
(Source impedance 10kΩ)
LINE (INPUT) 50mV
(Input impedance 91kΩ)
Output (Reference level)
LINE (OUTPUT) 330mV
(Output load impedance 50kΩ)

Furnished Parts

Operating instructions 1
Connection cord with pin plugs 2

Subfunctions

- Dolby NR system (B type/C type)
- 3 position tape selector (NORM/CrO_2/METAL)
- Air damped eject function
- Full automatic stop function
- Timer stand-by function
- LED level meter
- One-touch recording

Miscellaneous

Power requirements
KU, KC models AC120V, 60Hz
HEM model AC220V, 50/60Hz
HB, HP models AC240V, 50/60Hz
D, D/G models . . . AC120V/220V/240V, 50/60Hz (switchable)
Power Consumption
KU, KC models . . . . . 16 watts
HEM, HB, HP models . . . . . 20 watts
D, D/G models . . . . . 16 watts
Dimensions . . . . . 420 (W) x 120 (H) x 238 (D) mm
16-9/16 (W) x 4-6/8 (H) x 9-3/8 (D) in
Weight (without package) . . . . . 3.9kg (8lb 10 oz)

NOTE:
Specifications and the design subject to possible modifications without notice due to improvements.

e. Your advice, opinion or ideas related to servicing this product.

2. SERVICE MANUAL EVALUATION

a. Circuit & Mechanism Description

b. Circuit Diagram

3. OTHER

Please describe other areas of servicing which you may find difficult.

Completed by : Date :

Company Name :

Address :

City/State/Zip :

Please send this form filled to the distributor in your country.

QUESTIONNAIRE

MODEL _____

One Model per questionnaire

Dear Servicer,

Thank you for your cooperation in the post-sale service of Pioneer products.

This questionnaire is used as a tool to improve the serviceability of our products and service manuals. Please evaluate this model and service manual by answering the following questions. Your ideas may be realized in our future products. Your answers will be appreciated. Thank you.

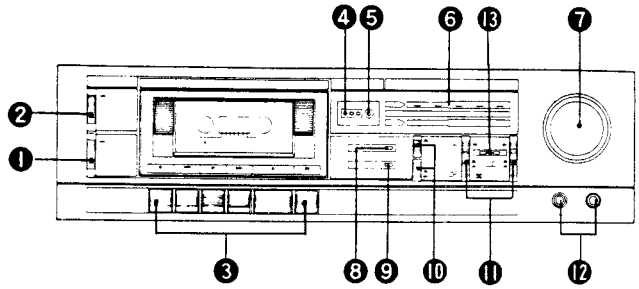
PIONEER ELECTRONIC CORP.

T. Nakagawa, Manager, Service Section, International Division

1. SERVICING EVALUATION	Circle applicable number:	Good		Fair		Poor
a. Disassembly/Re-assembly:		1	2	3	*4	*5
b. Circuit Checks:		1	2	3	*4	*5
c. Replacement of Parts:		1	2	3	*4	*5
d. Adjustment (s):		1	2	3	*4	*5

* If (4) or (5) was circled, please be specific.

2. FRONT PANEL FACILITIES



❶ POWER SWITCH

❷ EJECT BUTTON
Push this button to open the cassette door.

❸ OPERATION SWITCHES
● (Rec) : Push this switch to start recording. When depressed to the ON position, the REC indicator lights. The switch does not work when a cassette is not loaded or when the erasure prevention tabs of a loaded cassette have been broken off.

◀◀ (REW) : Push this switch to rewind the tape quickly.

▶ (Play) : Push this switch to start tape playback.

▶▶ (FF) : Push this switch to send the tape forward quickly.

■ (Stop) : Push this switch to stop the tape running and to release the function switches.

❚❚ (Pause) : Push this switch to stop the tape temporarily. Release it to resume running.
The tape does not stop during fast forward or rewind operations even when the ❚❚ (pause) switch is pushed.

❹ TAPE COUNTER

❺ RESET BUTTON
Push this button to reset the tape counter display to 000.

❻ LEVEL METER

❼ REC LEVEL CONTROL

❽ REC INDICATOR
This lights during the recording mode.

❾ POWER INDICATOR

❿ TAPE SELECTOR
These selectors allow the tape's bias and equalization characteristics to be selected during recording and the equalization characteristics during playback, in line with the type of tape being used.

Normal tape : Release the top switch (▁▔ NORM).

Chrome tape : Depress the top switch (▔▁ HIGH) and release the bottom switch (▁▔ CrO_2).

Metal tape : Depress both the top and bottom switches (▔▁ HIGH, ▔▁ METAL).

⓫ *DOLBY NR SWITCH
When the Dolby NR (Noise Reduction) system is used to record a tape, or when playing back a tape recorded on the Dolby NR system, depress the switch on the left to the ON position (▔▁). There are two types of the Dolby NR system, B-type and C-type. Use the switch on the right to choose the type. To choose B-type, the switch should be in the released position (▁▔). To choose C-type, the switch should be in the depressed position (▔▁).

When playing a tape which has not been recorded on the Dolby NR system, set the switch on the left so that it is in the released position (▁▔).

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*Noise Reduction manufactured under license from Dolby Laboratories Licensing Corporation.
"Dolby" and the double-D symbol are trademarks of Dolby Laboratories licensing Corporation.

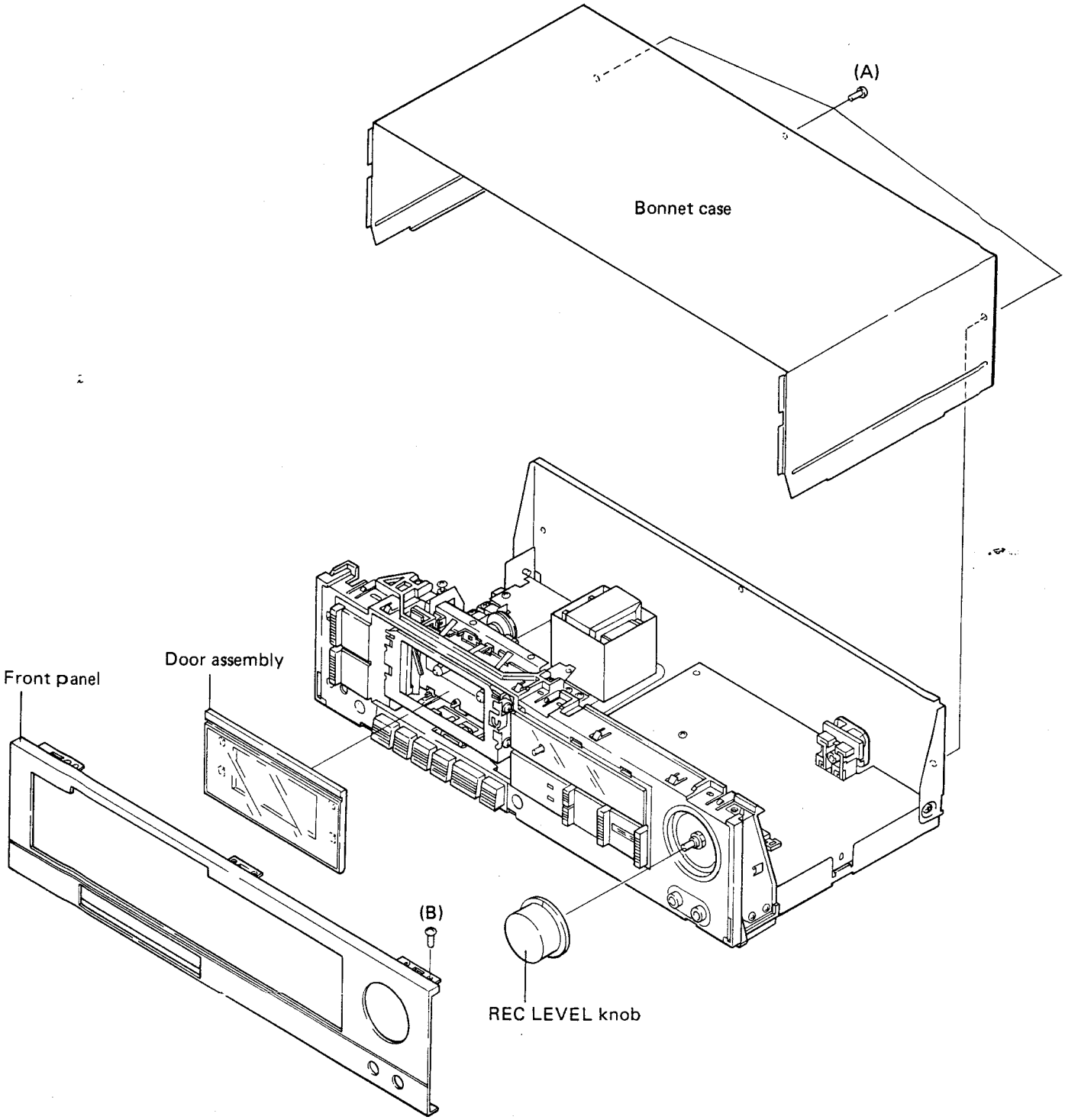
⓬ MIC JACKS
These are the input jacks for microphone recording.

⓭ DOLBY NR INDICATORS
These light when the DOLBY NR switch is set to ON.

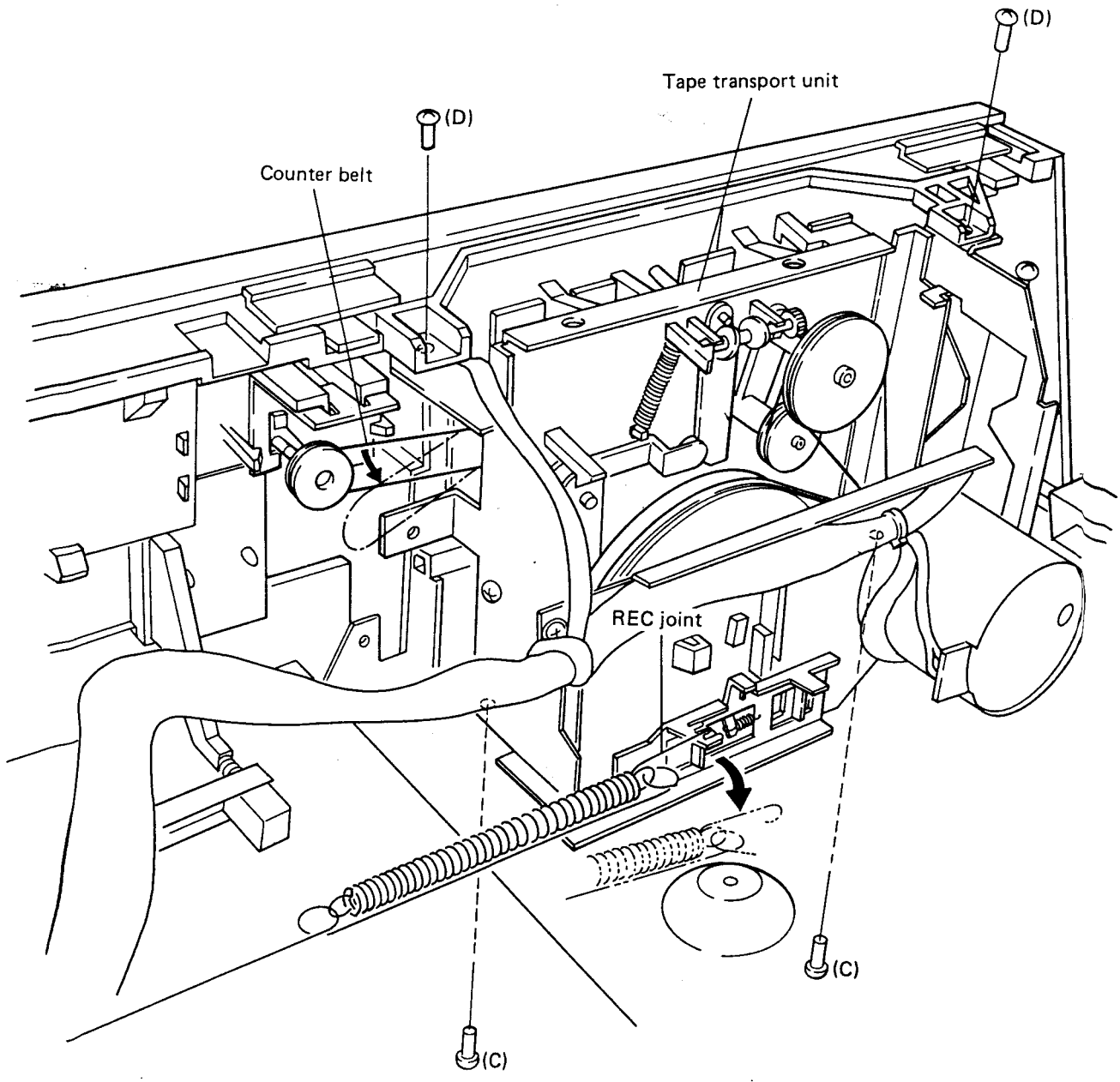
[B]: This lights when the B type Dolby noise reduction system is operating.

[C]: This lights when the C type Dolby noise reduction system is operating.

3. DISASSEMBLY



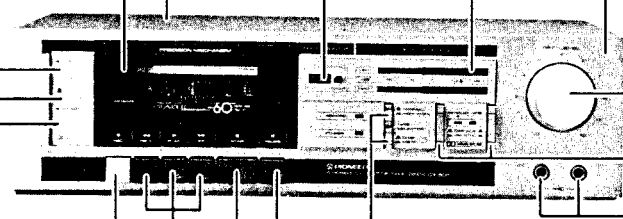
- **Bonnet Case**
  Remove screws (A) (rear side).
- **Front Panel**
  Pull off the REC LEVEL knob, and remove screw (B), and remove the upper and lower retaining hooks.
- **Door Assembly**
  Press the EJECT button to open the cassette holder. Lift the door assembly upward and pull outward.
- **Tape Transport Unit**
  Remove the counter belt and REC joint. Remove screws (C) (bottom side) and screws (D) (top side).



4. PARTS LOCATION

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Front Panel View



Bonnet case
RNA-647 (for CT-501)
RNA-648 (for CT-450, 405)

★★ Door assembly
RXX-456 (for CT-501)
RXX-457 (for CT-450)
RXX-458 (for CT-405)

Knob cap (EJECT, POWER)
RAD-249

Panel stay
RNT-045 (for CT-501)
RNT-047 (for CT-450)
RNT-055 (for CT-405)

Knob (REC)
RAC-414 (for CT-501)
RAC-402 (for CT-450, 405)

Knob (PLAY, FF, REW)
RAC-403 (for CT-501)
RAC-390 (for CT-450, 405)

Tape counter
RAW-203

Knob (STOP)
RAC-404 (for CT-501)
RAC-391 (for CT-450, 405)

Meter panel
RAH-516 (for CT-501)
RAH-517 (for CT-450)
RAH-543 (for CT-405)

Front panel
RAH-513 (for CT-501)
RAH-515 (for CT-450)
RAH-542 (for CT-405)

Knob (REC LEVEL)
RAA-395

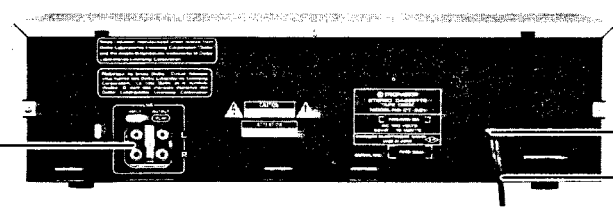
Knob cap (TAPE SELECTOR)
RAD-249

Phone jack with switch (MIC)
RKN-087

Knob cap A (DOLBY NR)
RAD-280

Knob (PAUSE)
RAC-403 (for CT-501)
RAC-390 (for CT-450, 405)

Rear Panel View

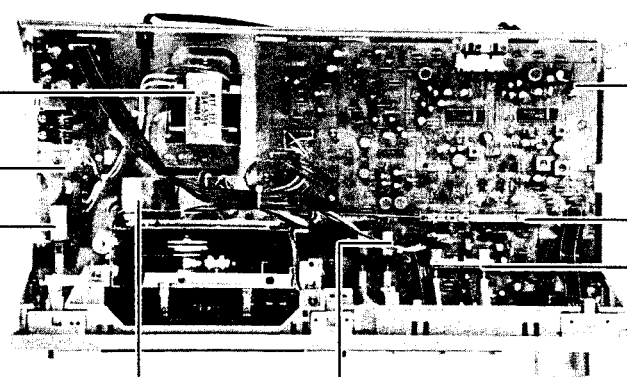


Terminal (LINE)
RKB-020

⚠ Strain relief
REC-395

⚠ AC power cord
RDG-048

Top View



⚠ ★ Power transformer
RTT-373

Power supply assembly

⚠ ★★ Push switch (POWER)
RSA-063

★★ Motor with pulley
RXM-088

Main assembly

★★ Slide switch (REC/PB)
RSH-042

★★ Push switch (TAPE SELECTOR)
RSG-161

★★ Push switch assembly (DOLBY NR)
RSG-160

5. ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*
  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	56 x 10^1	561	RD¼PS 5 6 1 J
47kΩ	47 x 10^3	473	RD¼PS 4 7 3 J
0.5Ω	0R5		RN2H 0 R 5 K
1Ω	010		RS1P 0 1 0 K

  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	562 x 10^1	5621.....	RN¼SR 5 6 2 1 F

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number , temperature, humidity, etc.

Miscellaneous Parts

Mark	Symbol & Description	Part No.
	Main assembly	Non supply
	Power supply assembly	Non supply
	Meter assembly	Non supply
	LED (A) assembly	Non supply
	LED (B) assembly	Non supply
	Volume assembly	Non supply
	Transistor (A) assembly	Non supply
	Transistor (B) assembly	Non supply

OTHERS

Mark	Symbol & Description		Part No.
⚠ ★	T1	Power transformer (120V)	RTT-373
★★	S1	Lever switch (PLAY)	RSN-034
★★	S2	Lever switch (FF)	RSN-033
★★	S3	Spring switch (REC)	RSN-025
★★		Motor with pulley	RXM-088
★★		REC/PB head	RPB-118
★		Erase head	RPB-085
⚠		AC power cord	RDG-048
⚠		Strain relief (for AC power cord)	REC-395

Main Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	Q101–Q105, Q109, Q201–Q205, Q209, Q305, Q306	2SC1740LN
★★	Q106	M5220L
★★	Q107, Q207	HA12058NT
★★	Q108	M5218L
★★	Q301, Q302	2SC1740LN-S
★★	Q303	2SC1741
★★	Q304	2SA933LN
★	D301–D310	1S2473
★	D311	RD5.1EB2 (MTZ5.1B)
⚠ ★	D312	RD15FB1

SWITCHES

Mark	Symbol & Description		Part No.
★★	S101	Switch (REC/PB)	RSH-042
★★	S102, S103	Push switch (TAPE SELECTOR)	RSG-161
★★	S104, S105	Push switch (DOLBY NR)	RSG-169

COILS

Mark	Symbol & Description		Part No.
	L101, L201	MPX filter	RTF-138
	L102, L103, L202, L203	Trap coil	RTF-153
	L104, L204	S.S. coil	RTF-159
	L105, L205	Trap coil	RTF-152
	L106, L206	Peaking coil (12mH)	RTF-129
	L301	Oscillator coil	RTD-032
	L302	Line coil	RTF-101

CAPACITORS

Mark	Symbol & Description	Part No.
	C127, C137, C227, C237	CEA R15M 50
	C125, C145, C225, C245	CEA R33M 50
	C128, C138, C228, C238	CEA R47M 50
	C129, C229	CEA R68M 50
	C143, C146, C154, C247, C246, C254	CEA 010M 50
	C114	CEA 4R7M 50
	C115, C130, C139, C163, C215, C230, C239, C263, C308	CEA 100M 16
	C310, C311, C315	CEA 220M 16
	C117, C141, C212, C217, C244, C309	CEA 330M 16
	C106, C153, C206, C322, C323	CEA 470M 16
	C112, C253, C307, C321	CEA 101M 16
	C124, C224, C313	CEA 221M 16
	C119, C219	CEANL 010M 50
	C123, C135, C223, C235	CEANL 4R7M 25
	C104, C109, C113, C116, C120, C204, C209, C213, C216, C220	CEANL 100M 16
	C303, C304	CQMA 332J 50
	C134, C234	CQMA 472J 50
	C132, C151, C232, C251	CQMA 562J 50
	C148, C248, C305	CQMA 682J 50
	C133, C147, C233, C247	CQMA 822J 50
	C108, C121, C208, C227	CQMA 103J 50
	C110, C210, C302	CQMA 153J 50
	C126, C226	CQMA 183J 50
	C122, C222	CQMA 333J 50
	C136, C236	CQMA 823J 50
	C301	CQPA 562J 100
	C103, C203	CQSA 471K 50
	C155, C255	CCDSL 101K 500
	C105, C114, C205, C214	CCDSL 101J 50
	C102, C152, C156, C202, C256	CKDYB 471K 50
	C142, C242	CKDYB 681K 50
	C312	CDDYF 103Z 50
	C101, C201, C319, C320	CKDYF 473Z 50
	C131, C231	CCPSL 390J 50

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
★	V102, V103, V202, V203 Semi-fixed 22k-B	RCP-223
★	V104, V204 Semi-fixed 150k-B	RCP-228
	R124	RD¼PMF 561J
⚠	R328	RS1LF 181J
	R101, R103, R106, R108, R109, R110, R114, R115–R120, R121, R156, R158–R161, R201, R203, R206, R208–R210, R215–R219, R220, R221, R256, R258–R261, R265, R301, R310, R312, R316, R317, R329, R340, R342	RD¼PM □□□ J
	Other resistors	RD1/6PM □□□ J

OTHERS

Mark	Symbol & Description	Part No.
	Shield case	RNH-209
	Terminal (LINE)	RKB-020
	Phone jack with switch (MIC L.R.)	RKN-087

Power Supply Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
⚠ ★	D401	1B2Z1-LC2
⚠ ★	D402	1B2C1-LC2
⚠ ★	D403, D404	1SR35-100A
⚠ ★	D407, C408	RD13EB1 (RD13EB2) (MTZ13A) (MTZ13B)

SWITCH

Mark	Symbol & Description		Part No.
	S401	Push switch (POWER)	RSA-063

CAPACITORS

Mark	Symbol & Description		Part No.
⚠	C401	Ceramic (0.01/AC250V)	RCG-008 (RCG-012)
	C408, C409		CEA 470M 16
	C404		CEA 101M 16
	C406		CEA 101M 35
	C405		CEA 471M 16
	C403		CEA 101M 25
	C402, C407		CEA 102M 35
	C411		CKDYF 473Z 50

RESISTORS

Mark	Symbol & Description	Part No.
⚠	R401	RD½PMF 561J
	R402	RD¼PM 561J
⚠	R403	RD½PMF 102J

Meter Assembly

SEMICONDUCTORS

Mark	Symbol & Description		Part No.
★★	Q501, Q502		BA6124
★	D501–D510	LED aray	LN101207PH

CAPACITORS

Mark	Symbol & Description	Part No.
	C503, C504, C505	CEA 100M 16

RESISTORS

Mark	Symb
	R503, R505,

LED (A) Ass

SEMICONDUC

Mark	Symb
★	D601,

LED (B) Ass

SEMICONDUC

Mark	Symb
★	D701,

Volume Asse

Mark	Symb
★	V801

Transistor (A

Mark	Symb
⚠ ★★	Q801

Transistor (B

Mark	Symb
⚠ ★★	Q901

External App

HA12058NT

M5220L
M5218L

RESISTORS

Mark	Symbol & Description	Part No.
	R503, R504	RD¼PM 103J
	R505, R506	RD½PMF 680J

LED (A) Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★	D601, D602	LN248RPH

LED (B) Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★	D701, D702	LN348GPH

Volume Assembly

Mark	Symbol & Description	Part No.
★	V801 2-gang variable (REC LEVEL)	RCV-120

Transistor (A) Assembly

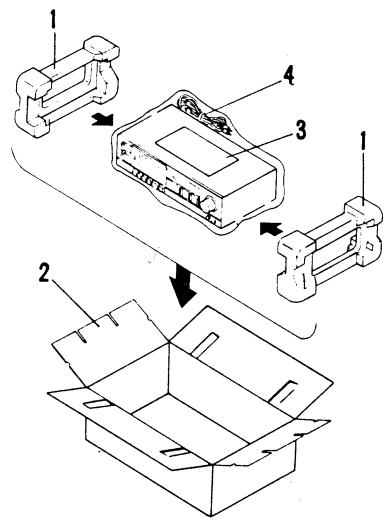
Mark	Symbol & Description	Part No.
⚠ ★★	Q801	2SD1265

Transistor (B) Assembly

Mark	Symbol & Description	Part No.
⚠ ★★	Q901	2SD1265

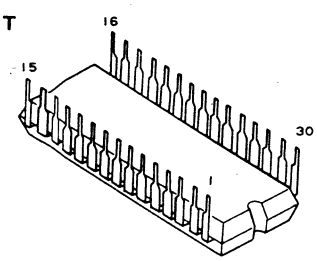
6. PACKING

Mark	No.	Part No.	Description
	1.	RHA-262	Side pad
	2.	RHG-714 (for CT-501)	Packing case
		RHG-720 (for CT-450)	Packing case
		RHG-757 (for CT-405)	Packing case
	3.	RRB-234 (for CT-501)	Operating instructions
		RRB-240 (for CT-450)	Operating instructions
		RRB-240 (for CT-405)	Operating instructions
	4.	RDE-010	Connection cord

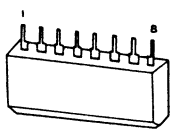


External Appearance of Transistors and ICs

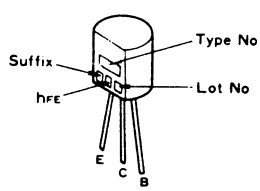
HA12058NT



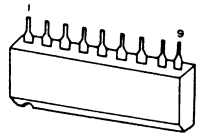
M5220L
M5218L



2SC1740LN
2SA933LN



BA6124



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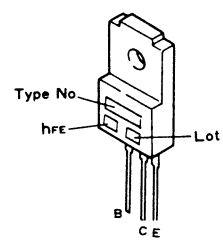

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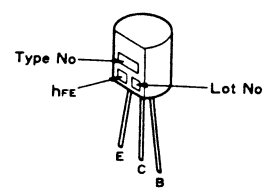
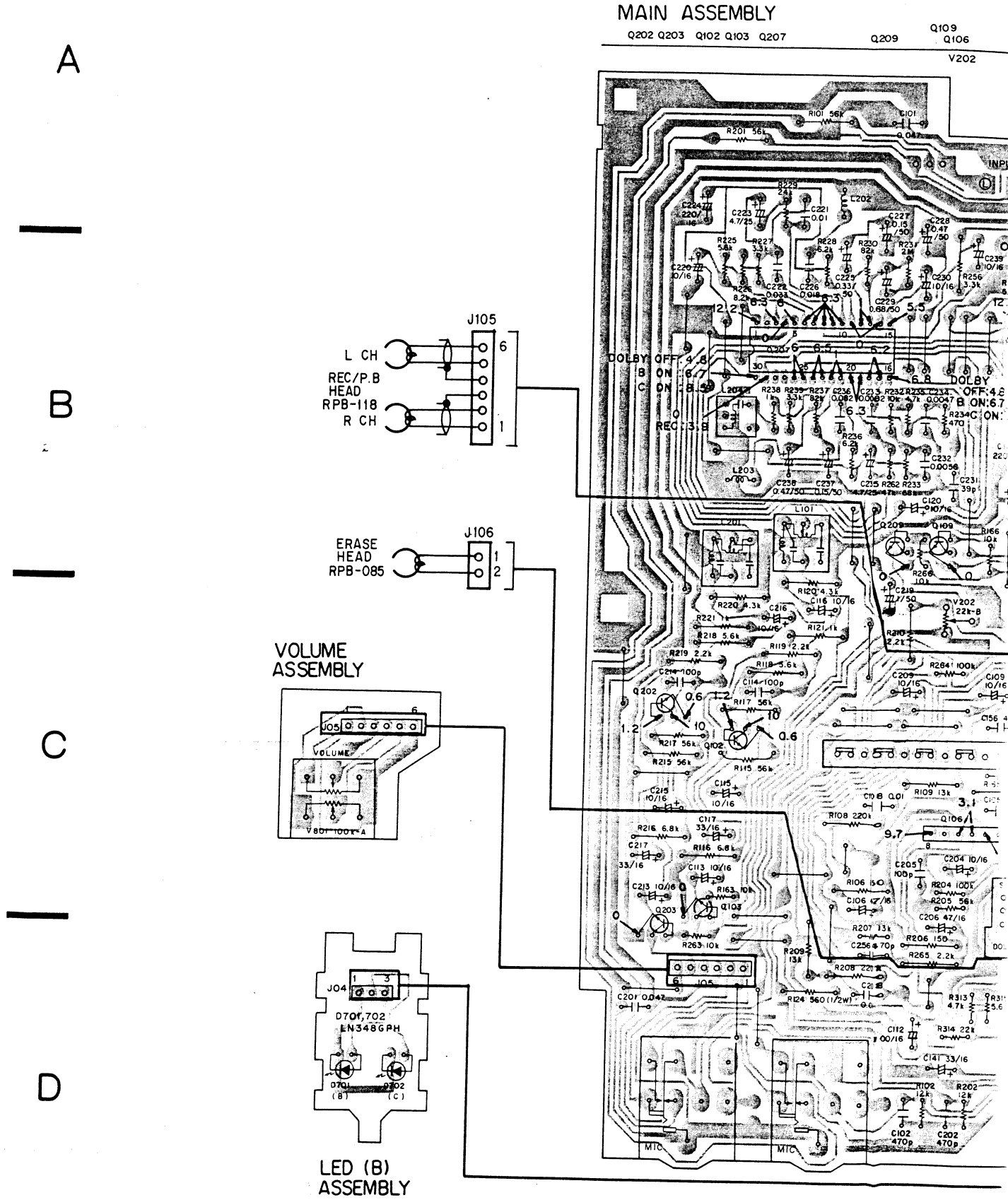
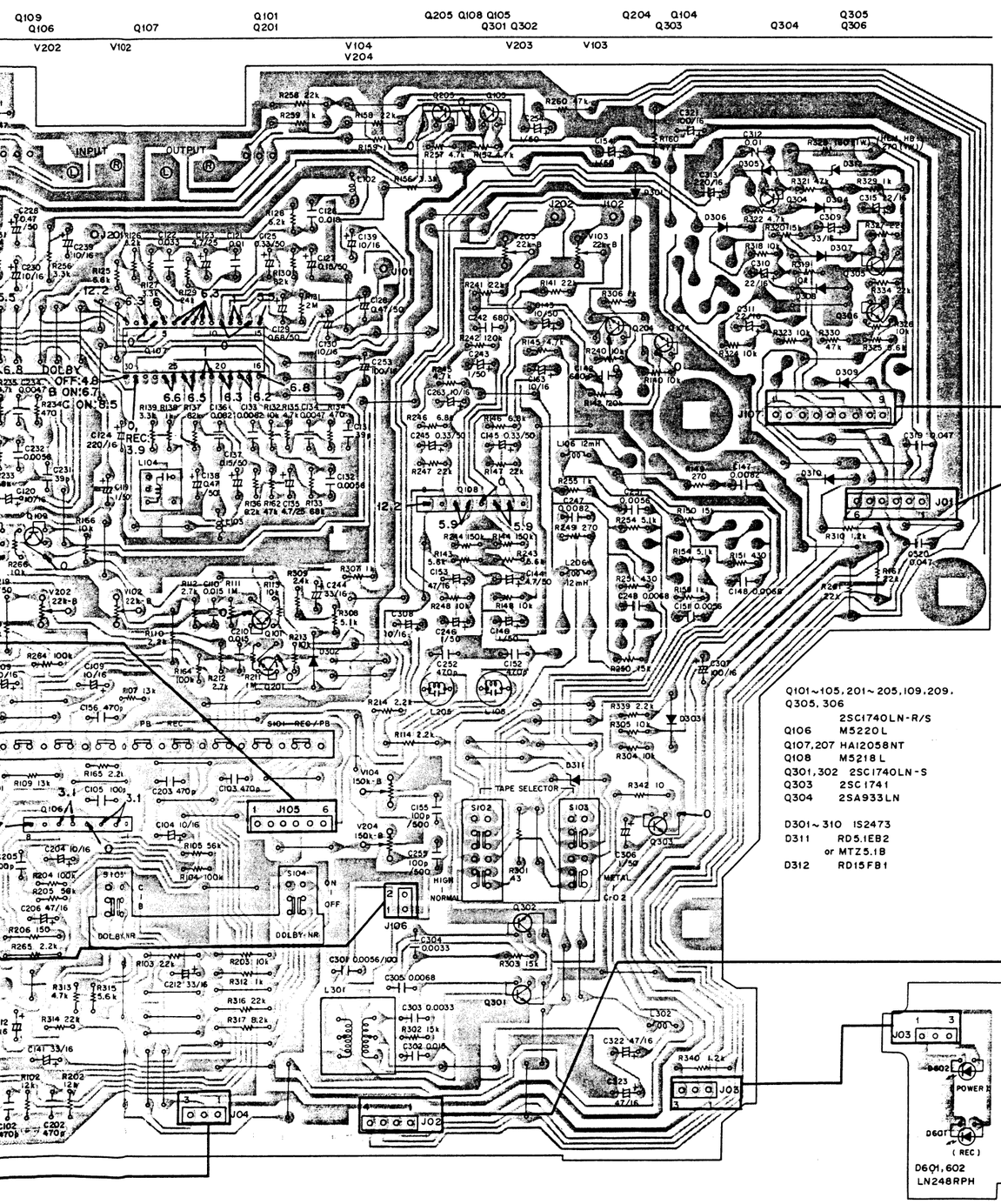


7. P.C.BOARDS CONNECTION DIAGRAM

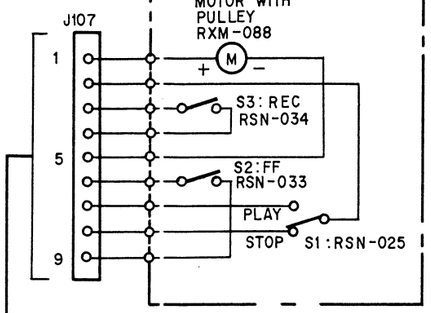




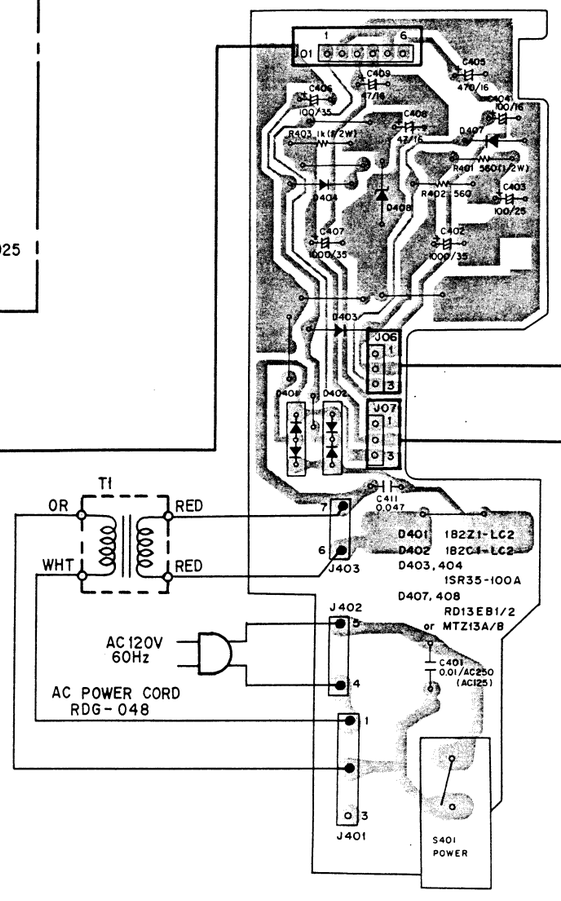
Q101~105, 201~205, 109, 209,
Q305, 306 2SC1740LN-R/S
Q106 M5220L
Q107, 207 HA12058NT
Q108 M5218L
Q301, 302 2SC1740LN-S
Q303 2SC1741
Q304 2SA933LN

D301~310 1S2473
D311 RD5.1EB2
or MTZ5.1B
D312 RD15FB1

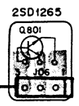
TAPE TRANSPORT ASSEMBLY



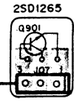
POWER SUPPLY ASSEMBLY

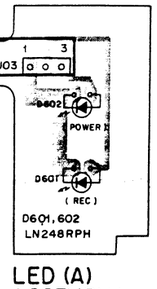


TRANSISTOR (A) ASSEMBLY

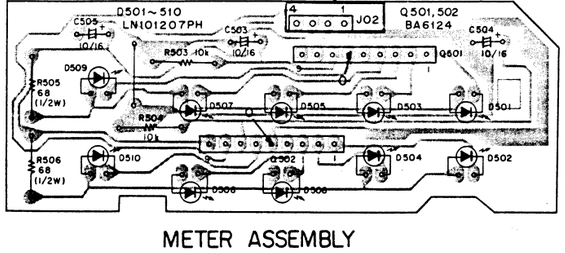


TRANSISTOR (B) ASSEMBLY



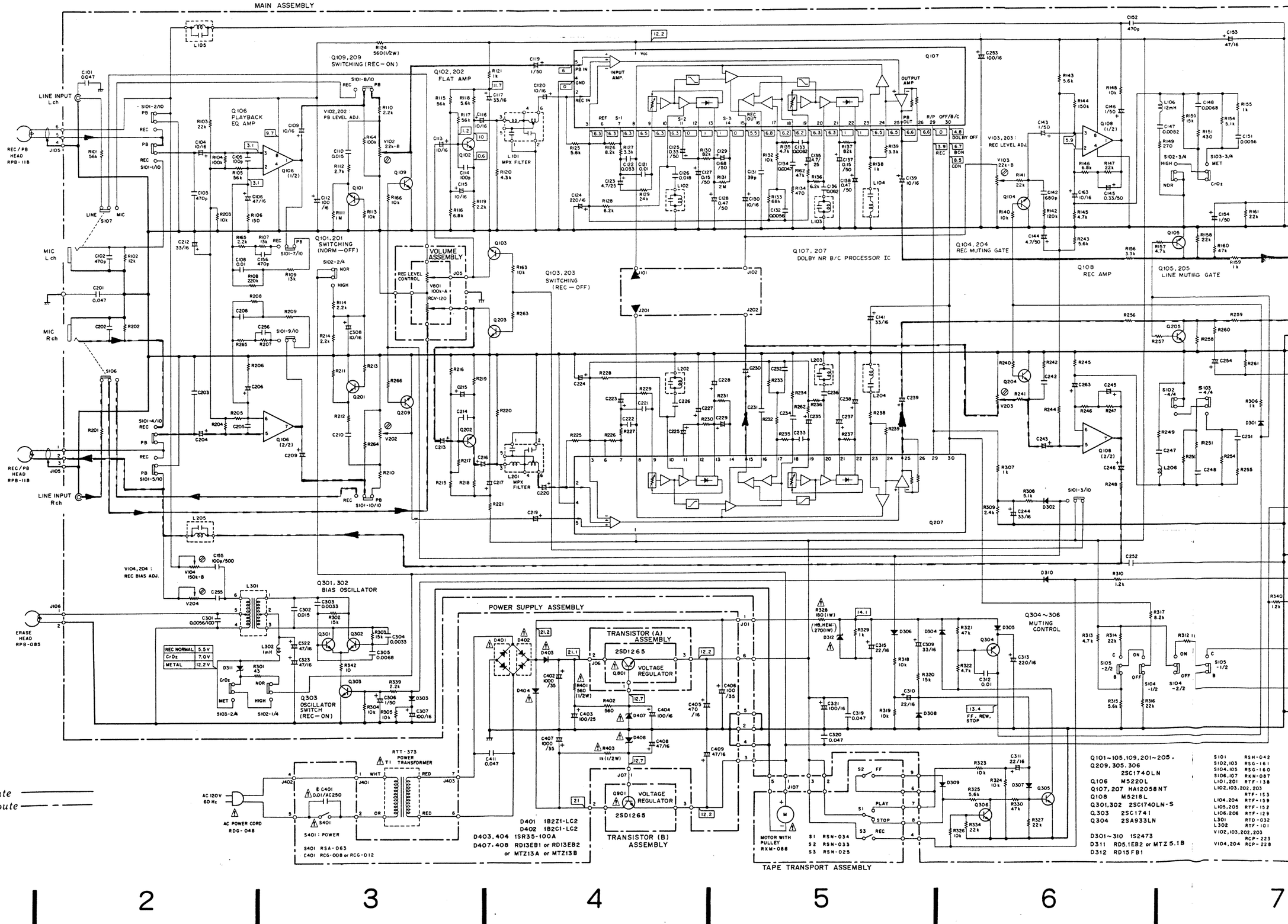


LED (A) ASSEMBLY

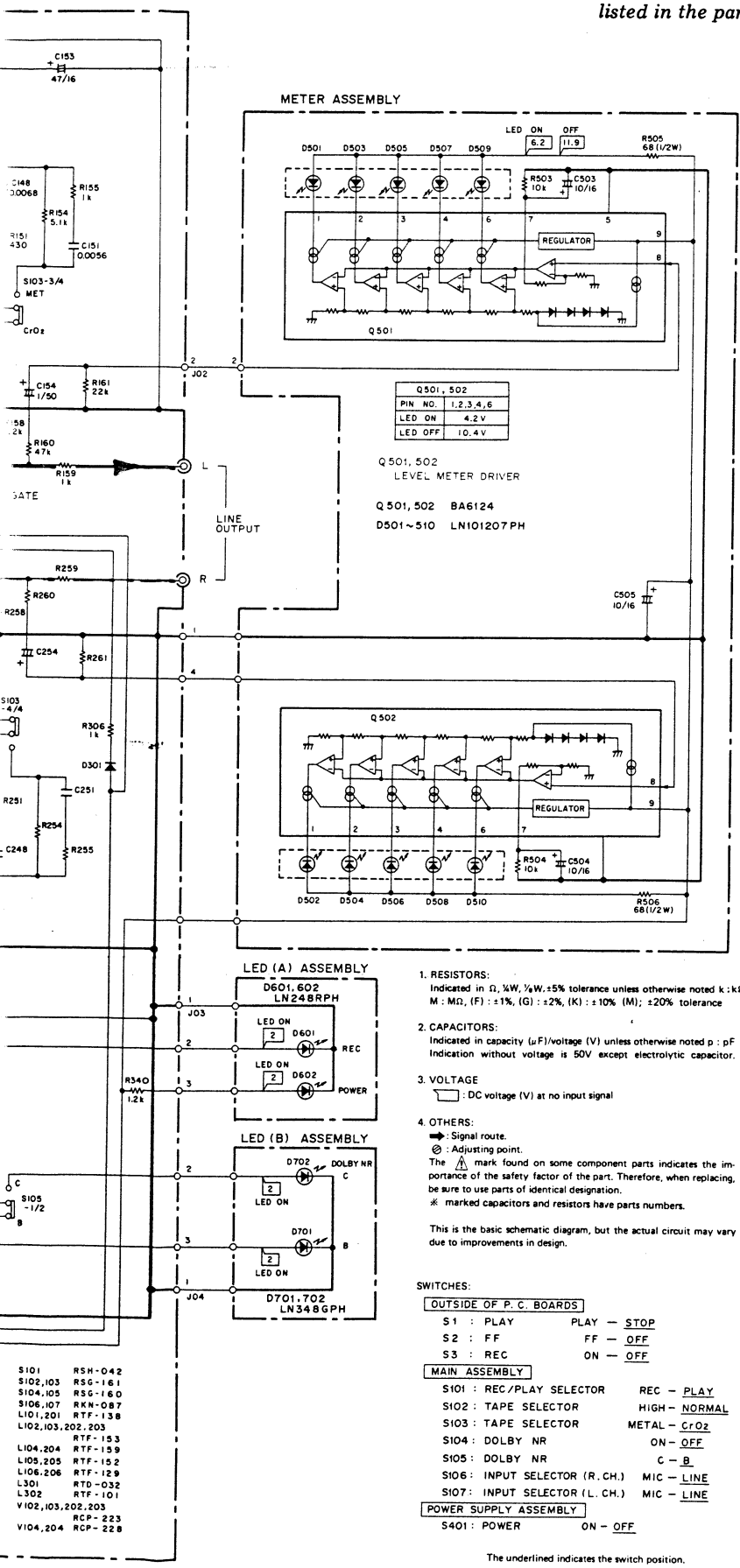


METER ASSEMBLY

8. SCHEMATIC DIAGRAM



NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.



S101 RSH-042
S102,103 RSG-161
S104,105 RSG-160
S106,107 RKN-087
L101,201 RTF-138
L102,103,202,203 RTF-153
L104,204 RTF-159
L105,205 RTF-152
L106,206 RTF-129
L301 RTD-032
L302 RTF-101
V102,103,202,203 RCP-223
V104,204 RCP-228

1. RESISTORS:
Indicated in Ω, ¼W, ⅛W, ±5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ±10% (M); ±20% tolerance

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p : pF
Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE
: DC voltage (V) at no input signal

4. OTHERS:
➡ : Signal route.
⊘ : Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
✳ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

SWITCHES:

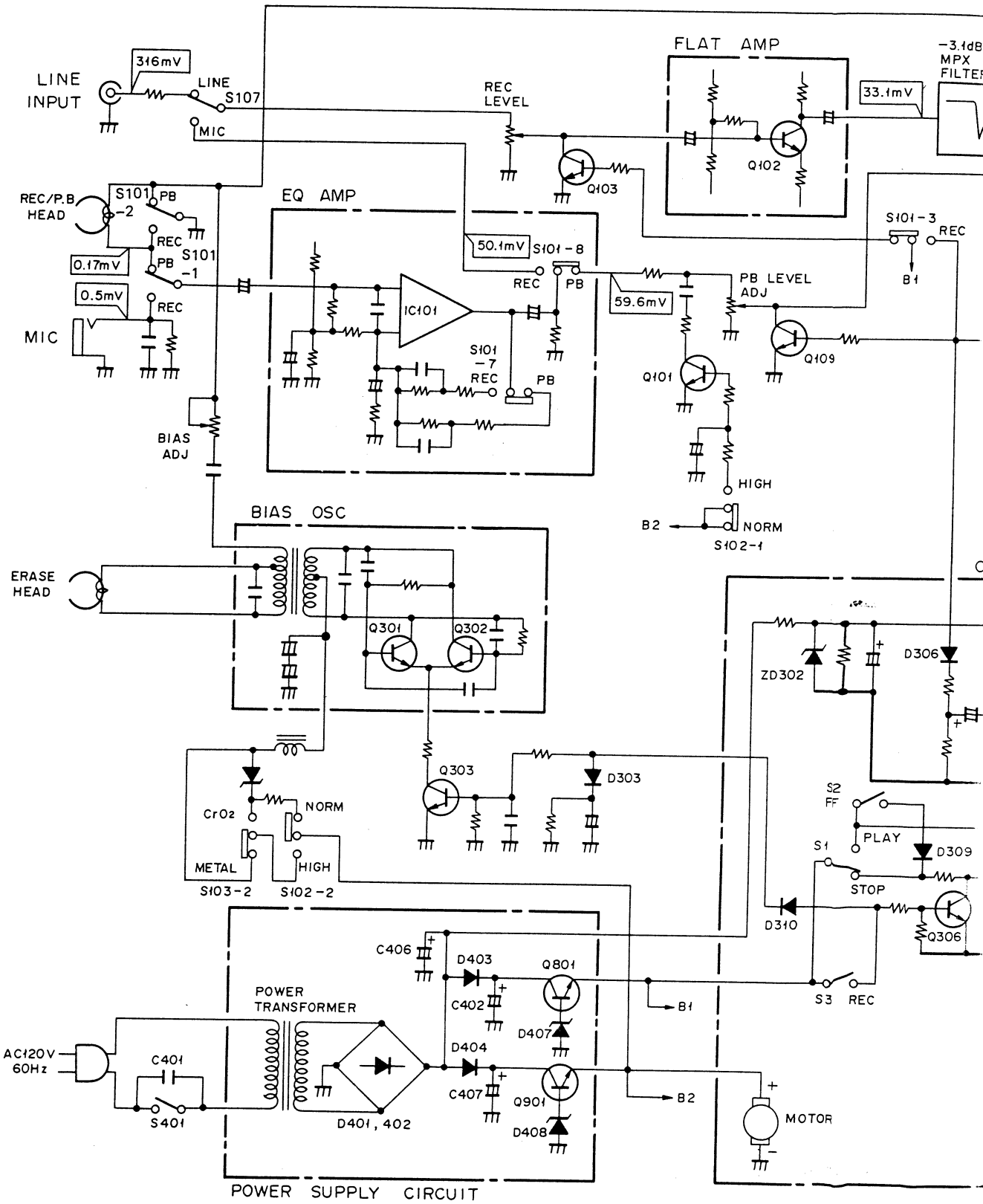
OUTSIDE OF P. C. BOARDS
S1 : PLAY — PLAY — STOP
S2 : FF — FF — OFF
S3 : REC — ON — OFF

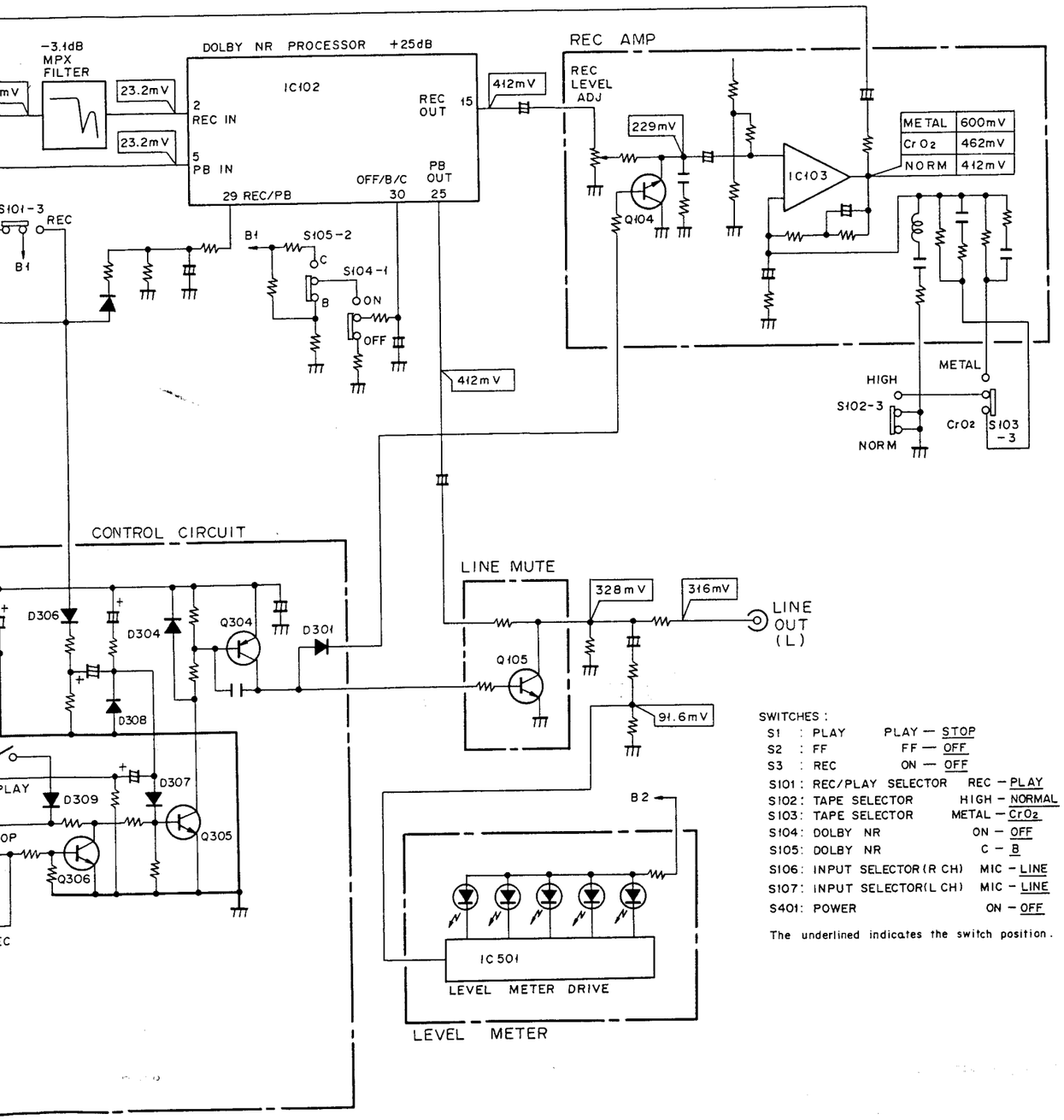
MAIN ASSEMBLY
S101 : REC/PLAY SELECTOR — REC — PLAY
S102 : TAPE SELECTOR — HIGH — NORMAL
S103 : TAPE SELECTOR — METAL — CrO2
S104 : DOLBY NR — ON — OFF
S105 : DOLBY NR — C — B
S106 : INPUT SELECTOR (R.CH.) — MIC — LINE
S107 : INPUT SELECTOR (L.CH.) — MIC — LINE

POWER SUPPLY ASSEMBLY
S401 : POWER — ON — OFF

The underlined indicates the switch position.

9. BLOCK DIAGRAM





SWITCHES :

S1	: PLAY	PLAY —	STOP
S2	: FF	FF —	OFF
S3	: REC	ON —	OFF
S101	: REC/PLAY SELECTOR	REC —	PLAY
S102	: TAPE SELECTOR	HIGH —	NORMAL
S103	: TAPE SELECTOR	METAL —	CrO_2
S104	: DOLBY NR	ON —	OFF
S105	: DOLBY NR	C —	B
S106	: INPUT SELECTOR (R CH)	MIC —	LINE
S107	: INPUT SELECTOR (L CH)	MIC —	LINE
S401	: POWER	ON —	OFF

The underlined indicates the switch position.

10. EXPLODED VIEWS AND PARTS LIST

NOTES:

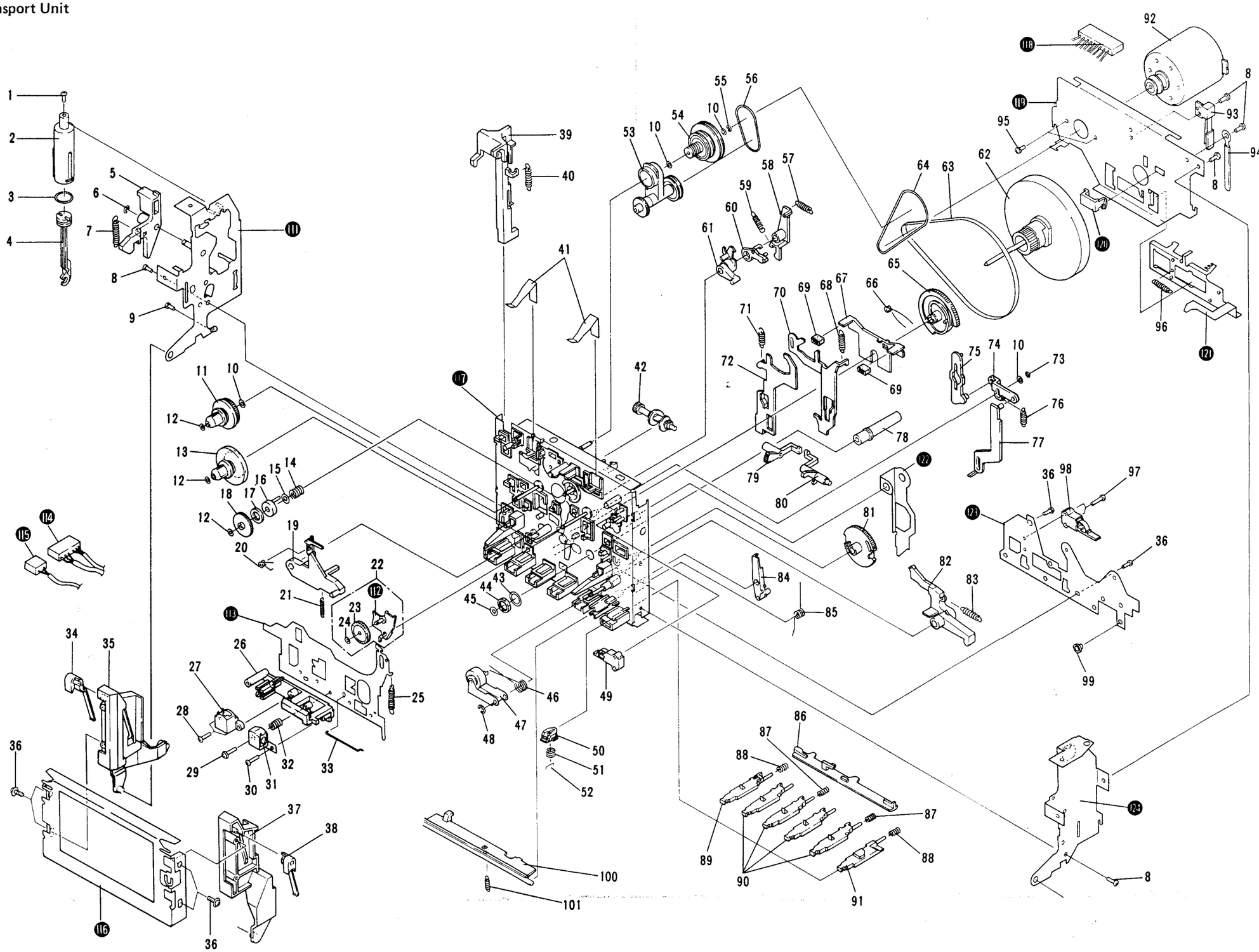
- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Parts List of Exterior

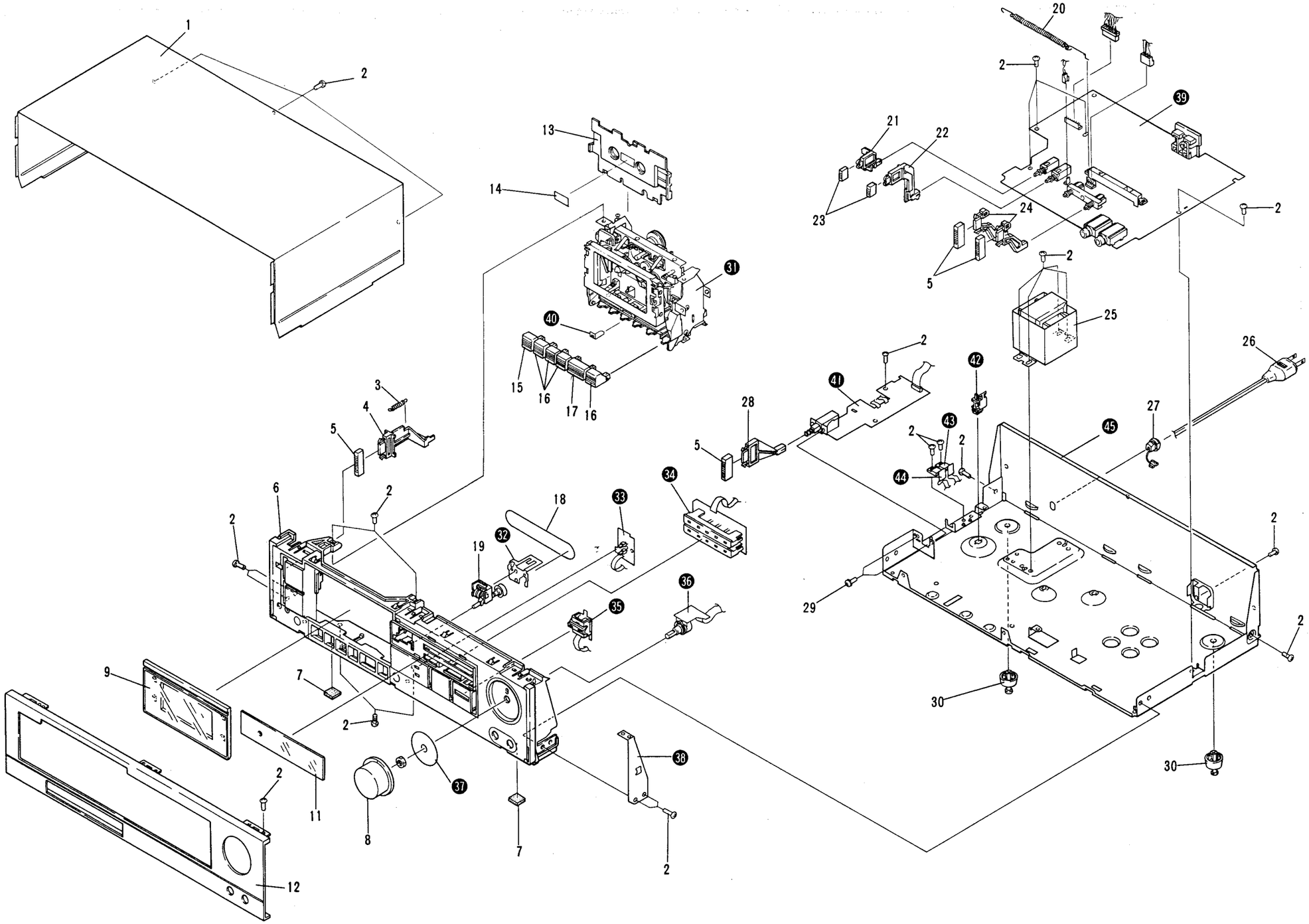
Mark	No.	Part No.	Description
	1.	RNA-647 (for CT-501)	Bonnet case
		RNA-648 (for CT-450)	Bonnet case
		RNA-648 (for CT-405)	Bonnet case
	2.	BBZ30P080FMC	Screw 3 x 8
	3.	RBL-061	Eject spring
	4.	RNL-845	Eject knob
	5.	RAD-249	Knob cap
	6.	RNT-045 (for CT-501)	Panel stay
		RNT-047 (for CT-450)	Panel stay
		RNT-055 (for CT-405)	Panel stay
	7.	REB-513	Skid
	8.	RAA-395	Knob (REC LEVEL)
★★	9.	RXX-456 (for CT-501)	Door assembly
		RXX-457 (for CT-450)	Door assembly
		RXX-458 (for CT-405)	Door assembly
	10.		
	11.	RAH-516 (for CT-501)	Meter panel
		RAH-517 (for CT-450)	Meter panel
		RAH-543 (for CT-405)	Meter panel
	12.	RAH-513 (for CT-501)	Front panel
		RAH-515 (for CT-450)	Front panel
		RAH-542 (for CT-405)	Front panel
	13.	RNL-838	Cassette plate
	14.	REE-081	Shining paper
	15.	RAC-414 (for CT-501)	Knob (REC)
		RAC-402 (for CT-450)	Knob (REC)
		RAC-402 (for CT-405)	Knob (REC)
	16.	RAC-403 (for CT-501)	Knob (PLAY FF, REW, PAUSE)
		RAC-390 (for CT-450)	Knob (PLAY, FF, REW, PAUSE)
		RAC-390 (for CT-405)	Knob (PLAY, FF, REW, PAUSE)
	17.	RAC-404 (for CT-501)	Knob (STOP)
		RAC-391 (for CT-450)	Knob (STOP)
		RAC-391 (for CT-405)	Knob (STOP)
★★	18.	REB-369	Counter belt
	19.	RAW-203	Tape counter
	20.	RBL-062	REC joint
	21.	RNL-861	Rod B
	22.	RNL-860	Rod A
	23.	RAD-280	Knob cap A (DOLBY NR)
	24.	RNL-846	Rod
⚠	★ 25.	RTT-373	Power transformer (120V)
⚠	26.	RDG-048	AC power cord
⚠	27.	REC-395	Strain relief
	28.	RNL-844	Power knob
	29.	PMA30P060FMC	Screw 3 x 6
	30.	REC-369	Foot assembly
	31.	Refer to pp. 21—24	Tape transport unit
	32.		Counter holder
	33.		LED (A) assembly
	34.		Meter assembly
	35.		LED (B) assembly
	36.		Volume assembly
	37.		Shield plate
	38.		Grounding plate
	39.		Main assembly
	40.		Spacer
	41.		Power supply assembly
	42.		Stud
	43.		Transistor (A) assembly
	44.		Transistor (B) assembly
	45.		Chassis

CT-501,450,405

Tape Transport Unit



Exterior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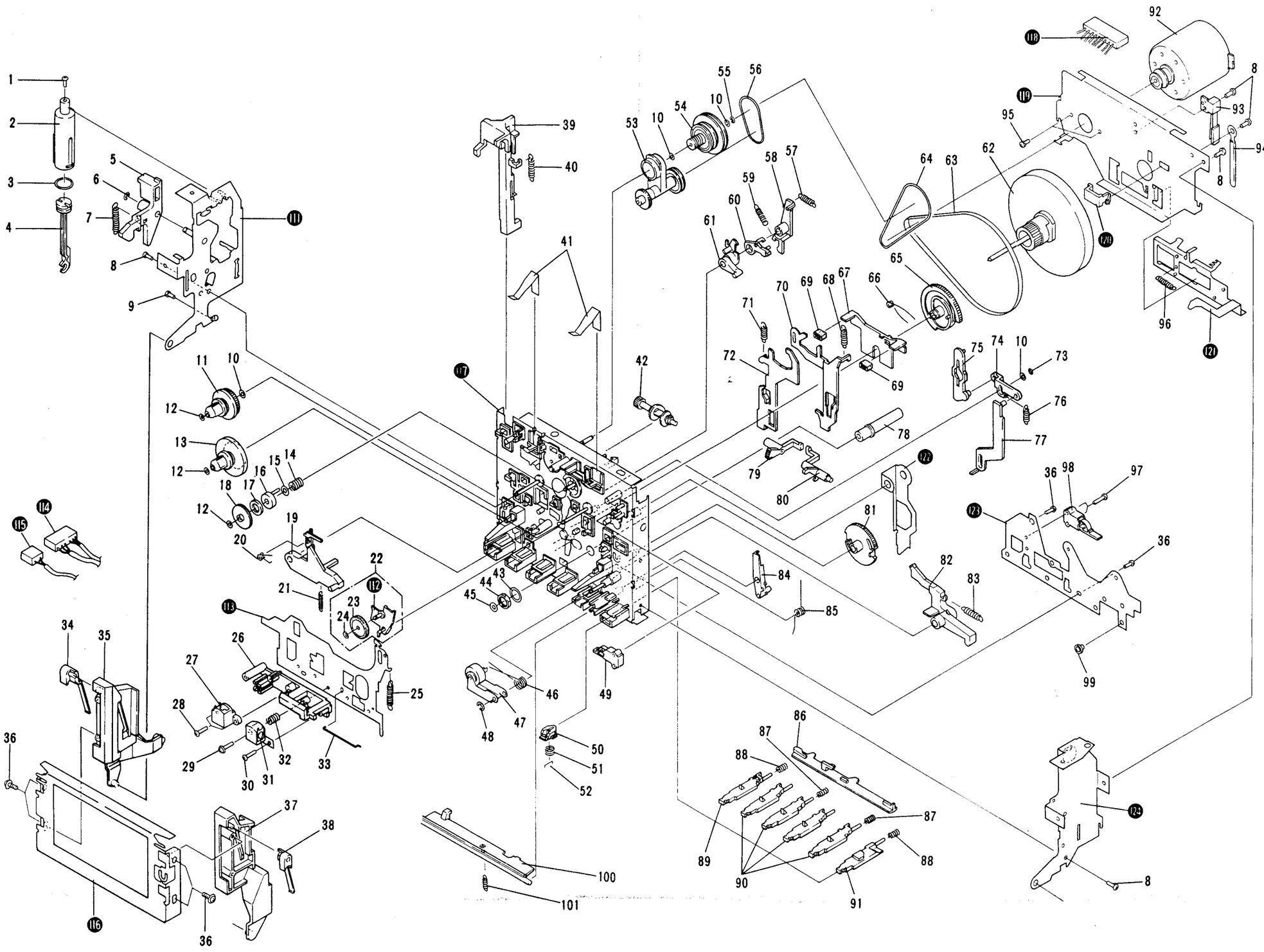
CT-501,450,405

Tape Transport Unit



- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Parts List of Tape Transport Unit

Mark	No.	Part No.	Description
	1.	VCZ26P090FMC	Screw 2.6 x 9
	2.	RNK-995	Cylinder
	3.	REB-447	O-ring
	4.	RNL-329	Piston
	5.	RNL-291	Eject lever
	6.	YE25FUC	Washer E-type
	7.	RBH-871	Pocket return spring
	8.	VCZ26P060FMC	Screw 2.6 x 6
	9.	PSZ20P060FMC	Screw 2 x 6
	10.	WA21D040D25	Washer
★★	11.	RXB-377	Supply reel base assembly
	12.	RBF-057	Washer
★★	13.	RXB-360	TU reel base assembly
	14.	RBH-885	Detector spring
	15.	RBF-071	Washer
	16.	RNL-318	Detector disk
	17.	RED-194	Detector felt
	18.	RNK-998	Idler gear
	19.	RNL-298	Action lever
	20.	RBH-873	Idler pressure spring
	21.	RBH-875	Action lever spring
	22.	RXB-579	Idler arm full assembly
★★	23.	RNL-337	TU idler
	24.	WA17D040D025	Washer
	25.	RBH-874	HB return spring
	26.	RNL-050	Sub-head base
★	27.	RPB-085	Erase head
	28.	PMZ20P130FMC	Screw 2 x 13
	29.	iMZ20Y120FMC	Screw 2 x 12
	30.	PMZ20P120FMC	Screw 2 x 12
★★	31.	RPB-118	REC/PB head
	32.	RBH-723	Head adjust spring
	33.	RBH-782	HB drive spring
	34.	RNL-057	Pocket spring L
	35.	RNL-439	Pocket L
	36.	BBZ26P080FZK	Screw 2.6 x 8
	37.	RNL-440	Pocket R
	38.	RNL-058	Pocket spring R
	39.	RNL-284	REC detector arm
	40.	RBH-883	Detector arm spring
	41.	RBK-166	Half set spring
	42.	RNL-322	Cam gear
	43.	RBE-021	Washer
	44.	NK90FCr	Nut
	45.	RBF-030	Oil stopper
	46.	RBH-890	Pinch pressure spring
★★	47.	RXB-495	Pinch arm assembly
	48.	YE20FUC	Washer E-type
★★	49.	RSN-034	Lever switch (S1)
	50.	RNL-334	Ratchet holder
	51.	RBH-888	Ratchet spring
	52.	RBH-870	Ratchet pin
	53.	RXB-577	Drive arm full assembly
	54.	RXB-976	Drive pulley assembly
	55.	YE15FUC	Washer E-type
★★	56.	REB-455	Drive belt B
	57.	RBH-876	Gear lever spring A
	58.	RNL-297	Gear lever A
	59.	RBH-877	Gear lever spring B
	60.	RNL-282	Gear lever B
	61.	RNL-296	Gear lever C
	62.	RXB-576	Flywheel assembly
★★	63.	REB-453	Capstan belt
★★	64.	REB-454	Drive belt A
	65.	RNL-288	Cam gear
	66.	RBH-879	Trigger spring
	67.	RNL-280	Brake plate
	68.	RBH-884	Action plate spring
	69.	REB-466	Brake shoe
	70.	RNL-811	FF action plate
	71.	RBH-916	Action plate spring L
	72.	RNL-810	REW action plate
	73.	YS20FBT	Washer C-type
	74.	RNL-275	Link
	75.	RNL-274	Detector lever
	76.	RBH-886	Link return spring
	77.	RNL-289	Stop lever
	78.	RXB-670	Metal holder A assembly
	79.	RNL-812	Joint L
	80.	RNL-276	Joint R

Mark	No.	Part No.	Description
	81.	RNL-831	Cam gear R
	82.	RNL-295	Pause lever
	83.	RBH-880	Pause lever spring
	84.	RNL-281	Gear lever R
	85.	RBH-881	Trigger spring R
	86.	RNL-486	REC connection arm
	87.	RBH-889	Button return spring
	88.	RBH-909	Pause button spring
	89.	RNL-487	REC button
	90.	RNL-287	Function button
	91.	RNL-279	Pause button
★★	92.	RXM-088	Motor with pulley
★★	93.	RSN-025	Spring switch (S3)
	94.	RNE-605	UL cord clamper D
	95.	PMA26P040FMC	Screw 2.6 x 4
	96.	RBH-882	REC return spring
	97.	PMZ20P080FMC	Screw 2 x 8
★★	98.	RSN-033	Lever switch (S2)
	99.	RLB-469	Collar
	100.	RNL-303	Lock plate
	101.	RBH-922	Lock plate spring
		REC-371	Cord binder
	111.		Side plate L assembly B
	112.		Idler arm assembly
	113.		Head base
	114.		Connector assembly 6-P
	115.		Connector assembly 2-P
	116.		Pocket frame B
	117.		Chassis assembly
	118.		Connector socket 9-P
	119.		Flywheel receptacle
	120.		Thrust receptacle
	121.		REC action plate
	122.		REC action lever
	123.		Plate
	124.		Side plate R
	125.	.....	

11. ADJUSTMENTS

11.1 MECHANICAL ADJUSTMENTS

Prior to Adjustment

Clean the both reel base, the capstan and the pinch roller with an alcohol moistened swab.

Pinch Roller Pressure Adjustment

1. Put the tape deck into the playback mode.
2. Gently push against the pinch roller arm with the tension gauge and separate the pinch roller slightly from the capstan.
3. Then the pinch roller back onto the capstan, and read the value when the pinch roller starts to rotate. If the reading fails to lie within 300g~500g, replace the pinch pressure spring.

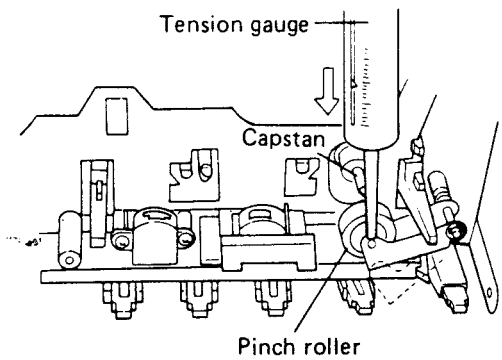


Fig. 11-1 Pinch roller pressure adjustment

Reel Base Torque Adjustment

Measure the torque with the torque meter during playback, fast forward (FF) and rewind (REW) modes. The measured values should normally lie within the allowable ranges listed in the table 1.

If the measured values lie outside the relevant ranges, replace the TU (take-up) reel base assembly and/or supply reel base assembly, TU idler, or drive arm full assembly.

Table 1

	TU reel base	Supply reel base
Playback mode	38 – 57g.cm	* 1.5 – 5g.cm
FF mode	75 – 135g.cm	* 1.5 – 5g.cm
REW mode	* 1.5– 5g.cm	75 – 135g.cm

** Denotes back tension torque.*

Tape Speed Adjustment

1. Connect the frequency counter to the LINE OUTPUT terminals.
2. Play back the 3kHz portion of the STD-301 test tape. At the beginning, the frequency should be lie within the 3000Hz~3010Hz range, and may be adjusted by turning the semi-fixed resistor located in the capstan motor adjustment hole as shown in Fig. 11-2.

NOTE:
Tape speed is increased by turning the semi-fixed resistor clock-wise, and decreased by turning counter-clockwise.

REC Switch Adjustment

1. Depress REC button. REC action lever moves to A direction. At this time, check that REC switch is ON.
2. Depress STOP button. The REC action lever moves slightly to B direction. At this time, bend and adjust the REC action lever so that a contact distance of REC switch is 0.2~0.5mm.

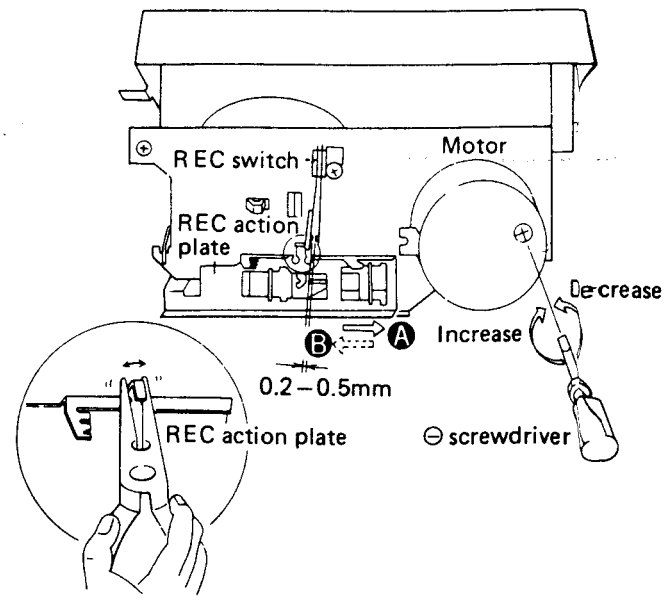


Fig. 11-2 Tape speed and REC switch adjustment

Door Damping Check and Adjustment

1. Press the EJECT button without a cassette loaded in the cassette compartment, and check that the door opens smoothly without stepwise movement, or rebounding after fully opening.
2. If these conditions are not satisfied, adjust by turning the adjustment screw in the head of the cylinder.

REC Joint Check and Adjustment

1. Check that the gap F between the REC joint and slide switch is 0 to 0.3mm when the transport mechanism is stationary (and check that the slide switch does not move).
2. Move the REC joint mechanism catching position backwards if the gap F is greater than 1.0 mm, but move it forwards if there is no gap and the slide switch is moving.
3. If the prescribed gap F cannot be obtained by the above adjustment, bend the hook section of the REC joint with a pair of pliers by an appropriate degree.
4. Check that the slide switch is fully switched when the transport mechanism is in recording mode.
5. Also check that the mechanism spring switch is shorted.

Turn the screw counter clockwise if the door opens stepwise in two stages.

Turn the screw clockwise if the door boundes back after fully opening.

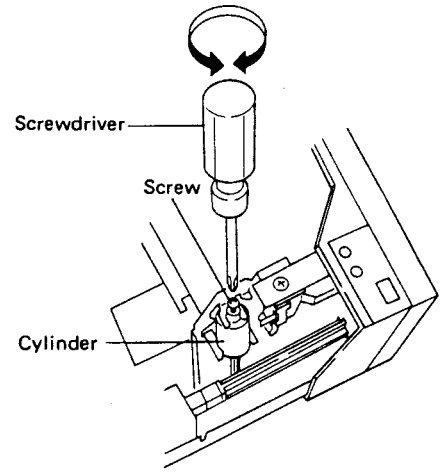


Fig. 11-3 Door damping check and adjustment

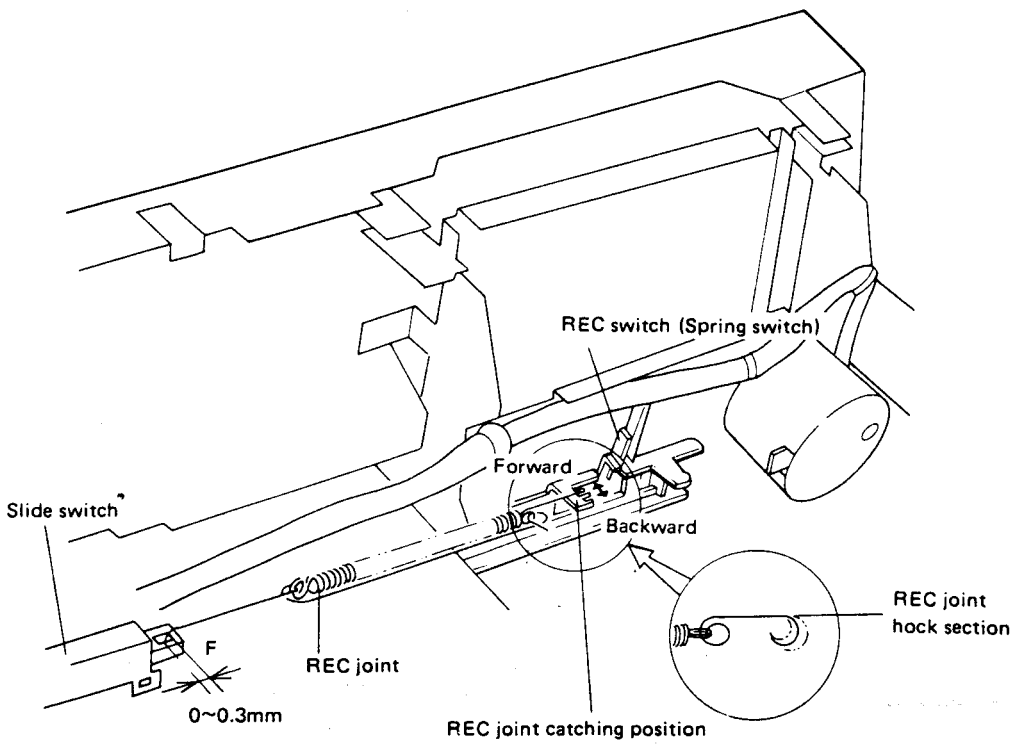


Fig. 11-4 Rec joint check and adjustment

11.2 ELECTRICAL ADJUSTMENTS

Adjustment Conditions

1. The mechanical adjustments must be completed first.
2. The head must be cleaned and demagnetized.
3. Allow the deck to age for at least a few minutes before commencing any electrical adjustments.
4. The reference signal is 0dB=1Vrms.
5. Connect a 50 kilo-ohm (or between 47 to 52 kilo-ohm) load resistance to the OUTPUT terminals.
6. Unless otherwise specified, the switches listed below are left in the positions indicated.
   DOLBY NR : OFF
   TAPE SELECTOR : NORM

Test Tapes

STD-331B : Playback adjustments (See Fig. 11-5)
STD-608A : NORMAL blank tape
STD-603 : CrO_2 blank tape
STD-610 : METAL blank tape

List of Adjustments

1. Head azimuth adjustment
2. Playback equalizer check
3. Playback level adjustment
4. Level meter check
5. Recording and playback frequency response adjustment
6. Recording level adjustment

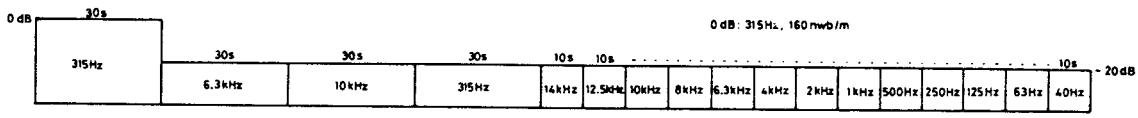


Fig. 11-5 Contents of the test tape STD-331B

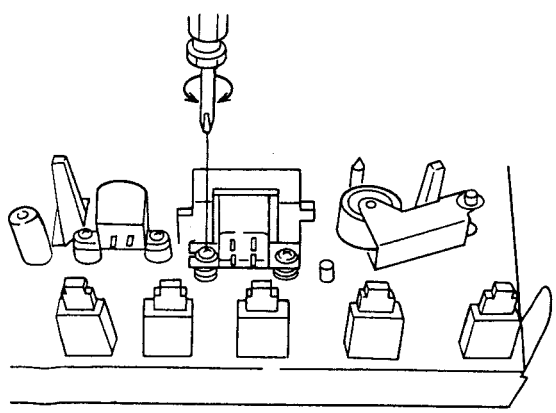


Fig. 11-6 Head azimuth adjustment

Test tape	STD-331B
Tape selector	NORM
DOLBY NR switch	OFF

• Due to "edge effect", compensate the right changed by −1dB at 40Hz and 63Hz.

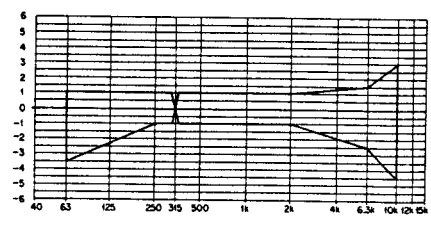


Fig. 11-7 Allowable playback frequency response zone

- Set the DOLBY NR switch to the OFF position.

1. Head Azimuth Adjustment
- Turn V101 and V201 to maximum position (fully clockwise).

	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	STOP	Set the TAPE SELECTOR switch to the NORM position.				
2	PLAY	Play the 10kHz/–20dB section of the STD-331B test tape.	Head azimuth adjustment screw. (See Fig. 11-6)	Left and right OUTPUT terminals.	Maximum playback signal level.	
3	STOP	Lock the screw with screw lock after completing the adjustment.				

2. Playback Equalizer Check

	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	STOP	Set the TAPE SELECTOR switch to the NORM position.				
2	PLAY	Play the 315Hz/–20dB and 6.3kHz/–20dB section of the STD-331B test tape.	Confirm	Left and right OUTPUT terminals.	The 6.3kHz playback level is –0.5± 2dB against 315Hz level.	
3	STOP	Set the TAPE SELECTOR switch to the CrO_2 or METAL position.				
4	PLAY	Play the 315Hz/–20dB and 6.3kHz/–20dB section of the STD-331B test tape.	Confirm	Left and right OUTPUT terminals.	The 6.3kHz playback level is –4.5±2 dB against 315Hz level.	

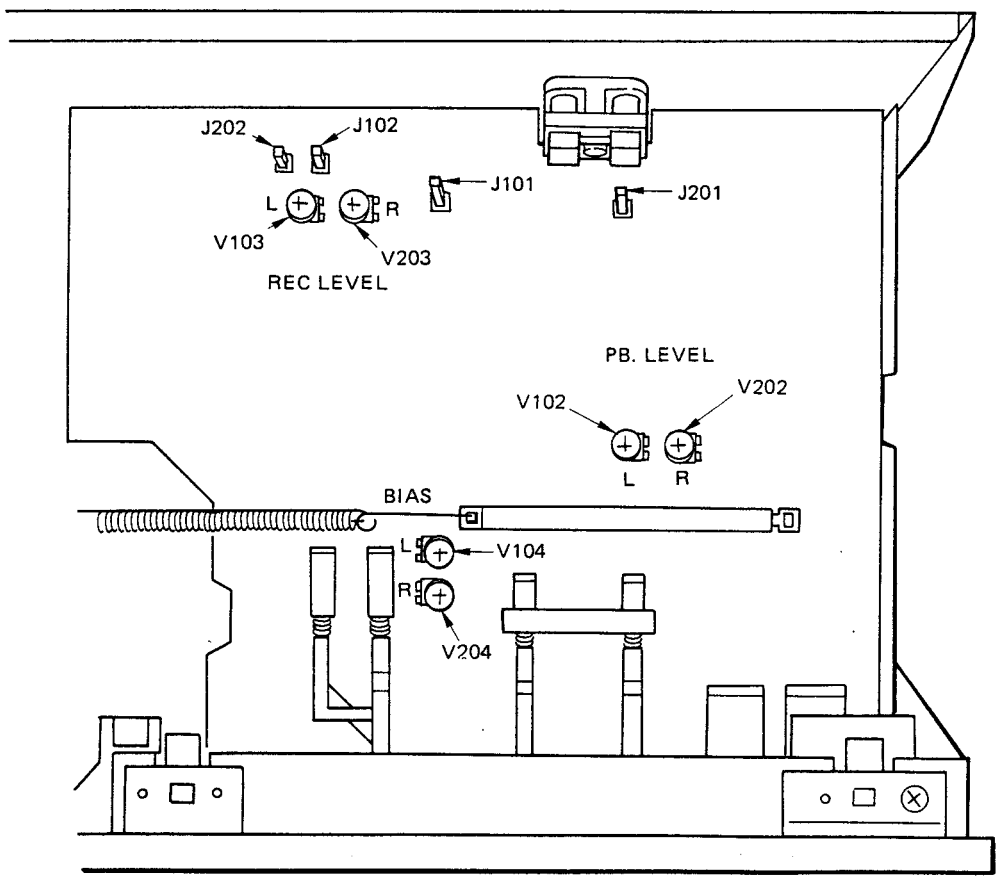


Fig. 11-8 Adjustments locations

3. Playback Level Adjustment

- This adjustment determines the DOLBY NR level, and must be performed with great care.

	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	STOP	Set the TAPE SELECTOR switch to the NORM position.				
2	PALY	Play the 315Hz/0dB section of the STD-331B test tape.	V102 (Left channel) V202 (Right channel)	J101 (L ch.) J201 (R ch.)	−7.7dBv (412.1mV)	

4. Level Meter Check

	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	REC-PAUSE	Apply a 315Hz/−10dBv (316mV) signal to the LINE INPUT terminals.	REC LEVEL control	Left and right OUTPUT terminals.	Check that the level meters "0dB" light up within −10dBv±1.8dB of the signal output level.	

5. Recording and Playback Frequency Response Adjustment

	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	STOP	Set the TAPE SELECTOR switch to the NORM position.				
2	REC-PAUSE	Apply a 315Hz/−30dBv (31.6mV) signal to the LINE INPUT terminals.	REC LEVEL control	Left and right OUTPUT terminals.	−30dBv (31.6mV)	
3	REC/PLAY	Record the above signal level onto the STD-608A test tape at 315Hz and 6.3kHz, and play back.	V104 (Left channel) V204 (Right channel)	Left and right OUTPUT terminals.	Adjust the 6.3kHz playback level to 0dB higher then the 315Hz level.	
4		Record and play back signal up to 12kHz onto the STD-608A test tape, and check that the allowable frequency response zone shown in Fig. 11-9 is satisfied. If the response zone is not met, change the adjustment value of step 3 within $^{+1}_{-0.5}$ dB and readjust step 3.				
5		Set the DOLBY NR switch to the ON position. Record and play back signals up to 10kHz onto the STD-608A test tape, and check that the allowable frequency response zone shown in Fig. 11-9 is satisfied (for DOLBY NR B and C).				
6		Set the TAPE SELECTOR switch to the CrO_2 position. Record and play back signals up to 12kHz onto the STD-603 test tape, and check that the allowable frequency response zone shown in Fig. 11-10 is satisfied (for DOLBY NR OFF, Band C).				
7		Set the TAPE SELECTOR switch to the METAL position. Record and play back signals up to 12kHz onto the STD-610 test tape, and check that the allowable frequency response zone shown in Fig. 11-11 is satisfied (for DOLBY NR OFF, Band C).				

6. Recording Level Adjustment

	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	STOP	Set the TAPE SELECTOR switch to the NORM position.				
2	REC-PAUSE	Apply a 315Hz/−10dBv (316mV) signal to the LINE INPUT terminals.	REC LEVEL control	J101 (L ch.) J201 (R ch.)	−7.7dBv (412.1mV)	
3		Set the DOLBY NR switch to the ON position.				
4	REC/PLAY	Record the above signal level onto the STD-608A test tape, and play back.	V103 (Left channel) V203 (Right channel)	J101 (L ch.) J201 (R ch.)	−7.7dBv (412.1mV)	
5		Set the TAPE SELECTOR switch to the CrO_2 position.				
6		Record the above signal onto the STD-603 test tape, and play back.	Confirm	J101 (L ch.) J201 (R ch.)	−7.7dBv±1.5dB	
7		Set the TAPE SELECTOR switch to the METAL position.				
8		Record the above signal onto the STD-610 test tape, and play back.	Confirm	J101 (L ch.) J201 (R ch.)	−7.7dBv±1.5dB	

Test Tape: STD-608A
TAPE SELECTOR: NORM

DOLBY NR: OFF	DOLBY NR: B-TYPE ON	DOLBY NR: C-TYPE ON

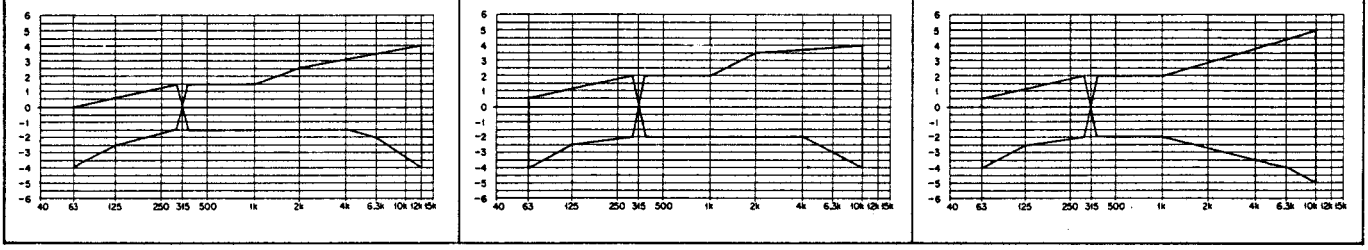


Fig. 11-9 Allowable recording and playback frequency response zone (NORM)

Test Tape: STD-603
TAPE SELECTOR: CrO_2

DOLBY NR: OFF	DOLBY NR: B-TYPE ON	DOLBY NR C-TYPE ON

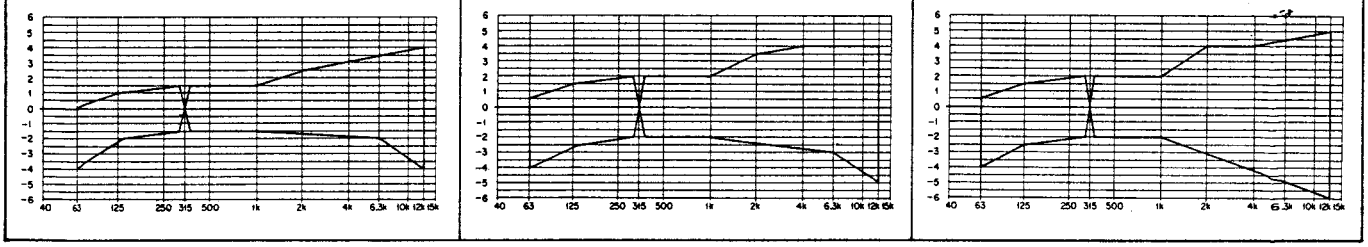


Fig. 11-10 Allowable recording and playback frequency response zone (CrO_2)

Test Tape: STD-610
TAPE SELECTOR: METAL

DOLBY NR: OFF	DOLBY NR: B-TYPE ON	DOLBY NR: C-TYPE ON

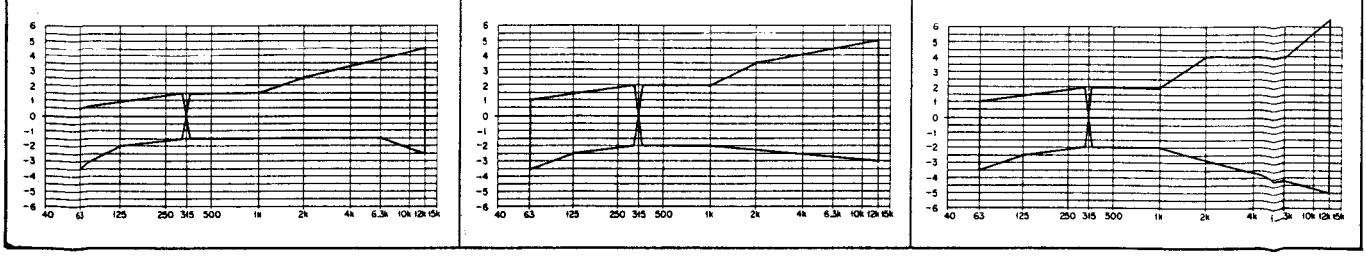


Fig. 11-11 Allowable recording and playback frequency response zone (METAL)

11. RÉGLAGE

11.1 RÉGLAGES DES MÉCANISMES

Avant de faire les réglages

Nettoyer les deux supports de bobine, le cabestan et le galet-presseur avec un bâtonnet imprégné d'alcool.

Réglage de pression du galet-presseur

1. Régler la platine-cassette en mode de lecture.
2. Repousser progressivement le bras supportant le galet-presseur à l'aide du tensiomètre et séparer légèrement le galet-presseur du cabestan.
3. Laisser revenir le galet-presseur contre le cabestan et interpréter la valeur indiquée dès que le galet-presseur commence à tourner. Si l'indication obtenue ne se trouve pas dans les limites de 300 à 500 gr., remplacer le ressort du galet-presseur.

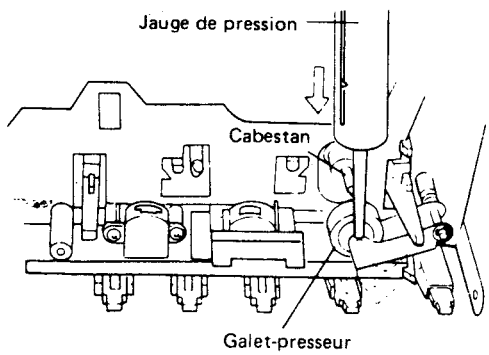


Fig. 11-1 Réglage de la force d'appui du galet-presseur

Réglage du couple de support de bobine

Mesurer le coupledu support de bobine à l'aide d'un couplemètre au cours des modes de lecture, avance rapide (FF) et de retour rapide (REW). Les valeurs relevées doivent normalement se trouver dans les limites admissibles qui sont indiquées dans le tableau 1.

Si les valeurs mesurées sont en-dehors de la gamme indiquée, remplacer l'ensamble support de bobine réceptrice (TU) et/or l'ensemble support de bobine débitrice, la poulie intermédiaire TU ou l'ensemble complet du bras d'entraînement.

Tableau 1

	Support de bobine débitrice	Support de bobine réceptrice
Mode de lecture	38 à 57 gr.cm	*1,5 à 5 gr.cm
Mode d'avance rapide	75 à 135 gr.cm	*1,5 à 5 gr.cm
Mode de retour rapide	*1,5 à 5 gr.cm	75 à 135 gr.cm

* *Indiquent des valeurs de contre-tension.*

Réglage de la vitesse de défilement de la bande

1. Raccorder un fréquencemètre aux prises de sortie de ligne "LINE OUTPUT".
2. Lire le passage préenregistré de 3kHz de la bande d'étalonnage STD-301. Dès le début, la fréquence indiquée doit se trouver entre 3000 et 3010Hz, celle-ci pouvant être ajustée en tournant la résistance ajustable qui se trouve dans le trou de réglage du moteur d'entraînement du cabestan, comme représenté sur la figure 11-2.

REMARQUE:
La vitesse de défilement de la bande augmente lorsque la résistance variable est tournée dans le sens des aiguilles d'une montre et diminue lorsque la résistance est tournée dans le contraire des aiguilles d'une montre.

Réglage du commutateur d'enregistrement "REC"

1. Appuyer sur la touche d'enregistrement (REC). Le levier de commande d'enregistrement se déplace dans la direction Ⓐ. Quand ces conditions sont obtenues, vérifier si le commutateur d'enregistrement est enclenché.
2. Appuyer sur la touche d'arrêt (STOP). Le levier de commande d'enregistrement se déplace dans la direction Ⓑ. Quand ces conditions sont obtenues, replier et ajuster le levier de commande d'enregistrement pour que la distance nécessaire à la mise en contact du commutateur d'enregistrement soit comprise entre 0,2 et 0,5mm.

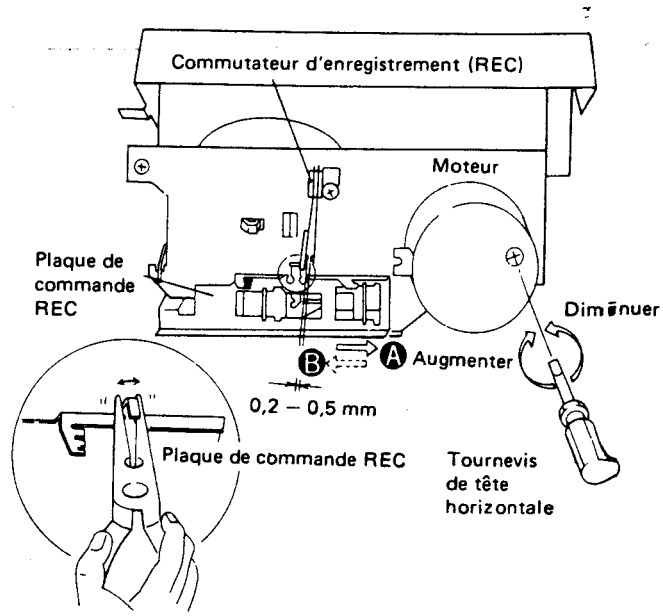


Fig. 11-2 Réglage de la vitesse de defilement de la bande et du commutateur d'enregistrement (REC)

Contrôle et réglage d'amortissement de la trappe à cassettes

1. Appuyer sur la touche d'éjection (EJECT) sans charger de cassette dans la trappe à cassettes et vérifier si la trappe s'ouvre normalement, progressivement et sans àcoups ni rebonds après son ouverture totale.
2. Si ces conditions ne sont pas satisfaites, effectuer un réglage à l'aide de la vis incorporée à la tête du cylindre.

Contrôle et réglage du raccord d'enregistrement

1. Vérifier si l'écartement F entre le raccord d'enregistrement et le commutateur à curseur se trouve entre 0 et 0,3mm lorsque le mécanisme d'entraînement est immobile et contrôler si le commutateur à curseur ne bouge pas.
2. Déplacer la position d'accrochage du mécanisme d'enregistrement vers l'arrière si l'écartement F est supérieur à 1mm et la déplacer vers l'avant quand il n'a aucun écart et que le commutateur à curseur bouge.
3. Si l'écartement F décrit plus haut ne peut pas être obtenu en procédant à ce réglage, replier la section du crochet de raccord d'enregistrement avec un paire de pinces sur la longueur appropriée.
4. Vérifier si le commutateur à curseur est parfaitement enclenché lorsque le mécanisme d'entraînement est placé en position d'enregistrement.
5. Vérifier également si le commutateur du ressort du mécanisme d'entraînement est court-circuité.

Tourner la vis dans le sens contraire des aiguilles d'une montre si la trappe s'ouvre par à-coups en deux étapes.

Tourner la vis dans le sens des aiguilles d'une montre si la trappe rebondit après s'être ouverte complètement

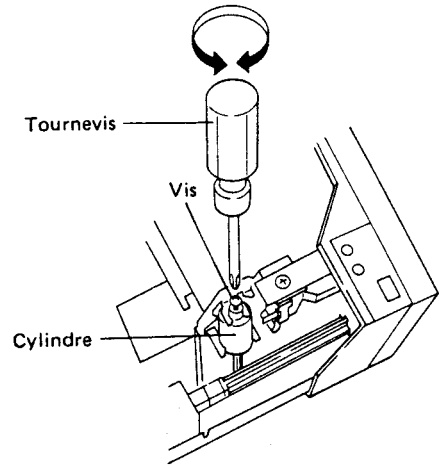


Fig. 11-3 Contrôle et réglage de l'amortissement de la trappe

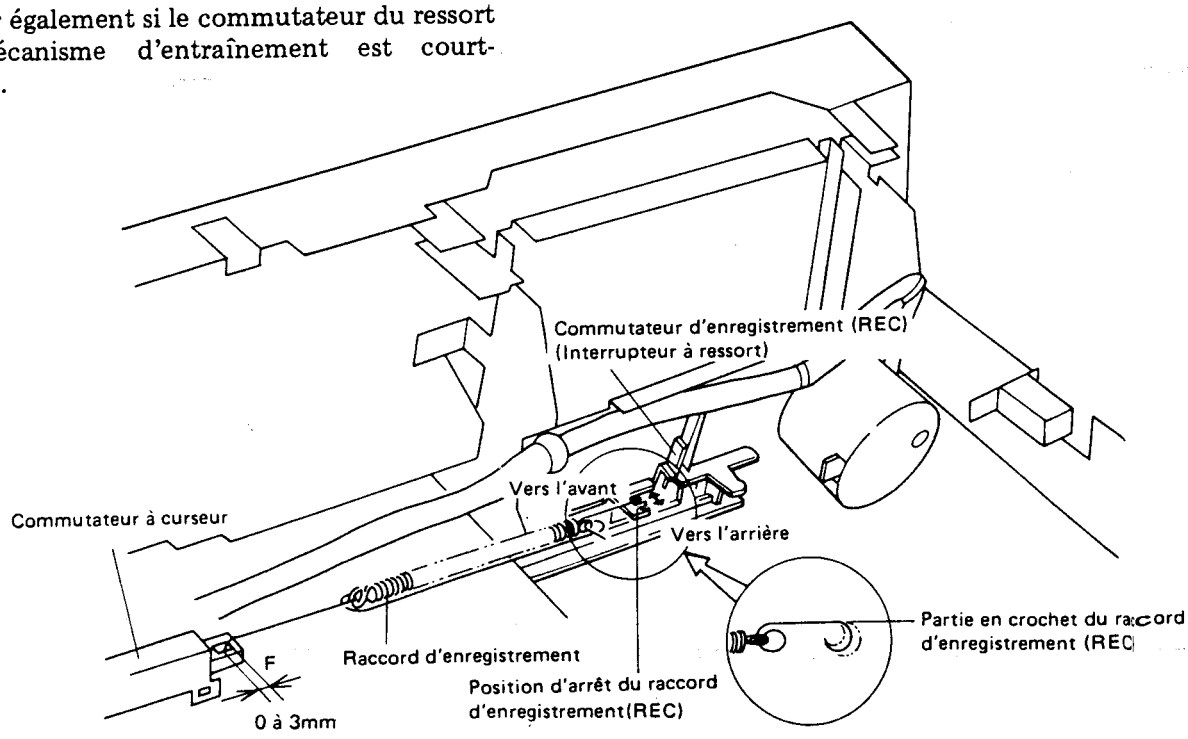


Fig. 11-4 Contrôle et réglage du raccord d'enregistrement

11.2 RÉGLAGES ÉLECTRIQUES

Conditions nécessaires pour effectuer les réglages

1. Les réglages des mécanismes doivent avoir été faits avant.
2. La tête magnétique doit être propre et démagnétisée.
3. La platine-cassette doit avoir fonctionnée pendant quelques minutes avant de commencer les réglages électriques.
4. Le signal de référence est de 0dB=1V effi.
5. Raccorder une résistance de charge de 50 k-ohms (ou de 47 à 52 k-ohms) aux prises de sortie "OUTPUT".
6. A moins d'une indication contraire, les commutateurs mentionnés ci-dessous doivent se trouver dans la position indiquée.
   DOLBY NR : Sur OFF
   TAPE SELECTOR : Sur NORM

Bandes de mesure

STD-331B : Réglages de lecture (Fig. 11-5)
STD-608A : Bande vierge ordinaire (NORMAL)
STD-603 : Bande vierge au chrome (CrO_2)
STD-610 : Bande vierge au fer (METAL)

Liste des réglages à exécuter

1. Réglage d'azimut de tête magnétique
2. Contrôle de l'égaliseur de lecture
3. Réglage de niveau de lecture
4. Contrôle de fonctionnement de décibelmètre
5. Calage de réponse en fréquence d'enregistrement et de lecture
6. Réglage du niveau d'enregistrement

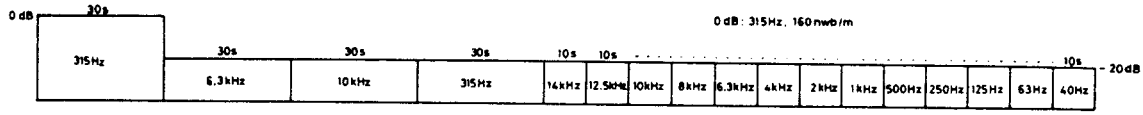


Fig. 11-5 Signaux préenregistrés sur la bande d'étalonnage STD-331B

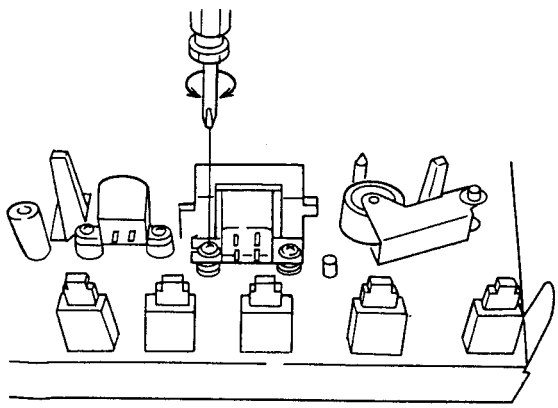


Fig. 11-6 Réglage d'azimut de tête magnétique

Bande d'étalonnage	STD-331B
Sélecteur de bande	NORM
Commutateur DOLBY NR	OFF

• Suite à l'effet de bordure, le canal droit doit être compensé de −1dB à 40Hz et 63Hz.

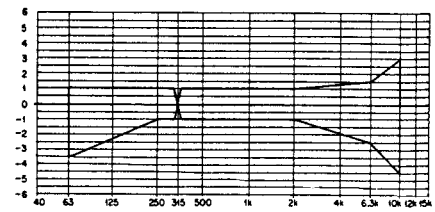


Fig. 11-7 Réponse en fréquence admissible en lecture

- Le commutateur DOLBY NR doit être placé en position OFF.

1. Réglage d'azimut de tête magnétique
- Tourner V101 et V201 sur leur position maximum (dans le sens maximum des aiguilles d'une montre)

	Mode	Signal appliqué et bande d'étalonnage	Emplacement du réglage	Emplacement de la borne de mesure	Valeur relevée	Observations
1	ARRÊT	Placer le sélecteur de bande (TAPE SELECTOR) en position "NORM".				
2	LECTURE	Lire le passage préenregistré de 10kHz/–20dB de la bande d'étalonnage STD-331B.	Vis de réglage d'azimut de tête. (Consulter la fugure 11-6).	Bornes de sortie droite et gauche "OUTPUT".	Niveau maximal du signal de lecture.	
3	ARRÊT	Bloquer la vis de réglage à la peinture lorsque le réglage est terminé.				

2. Contrôle de l'égaliseur de lecture

	Mode	Signal appliqué et bande d'étalonnage	Emplacement du réglage	Emplacement de la borne de mesure	Valeur relevée	Observations
1	ARRÊT	Placer le sélecteur de bande (TAPE SELECTOR) en position "NORM".				
2	LECTURE	Lire le passage préenregistré de 315kHz/–20dB et de 6,3kHz/–20dB de la bande d'étalonnage STD-331B.	Contrôler	Bornes de sortie droite et gauche "OUTPUT".	Le niveau de lecture de 6,3kHz est de –0,5±2dB par rapport au niveau de 315Hz.	
3	ARRÊT	Placer le sélecteur de bande (TAPE SELECTOR) en position "CrO_2" ou "METAL".				
4	LECTURE	Lire le passage préenregistré de 315kHz/–20dB et de 6,3kHz/–20dB de la bande d'étalonnage STD-331B.	Contrôler	Bornes de sortie droite et gauche "OUTPUT".	Le niveau de lecture de 6,3kHz est de –4,5±2dB per rapport au niveau de 315Hz.	

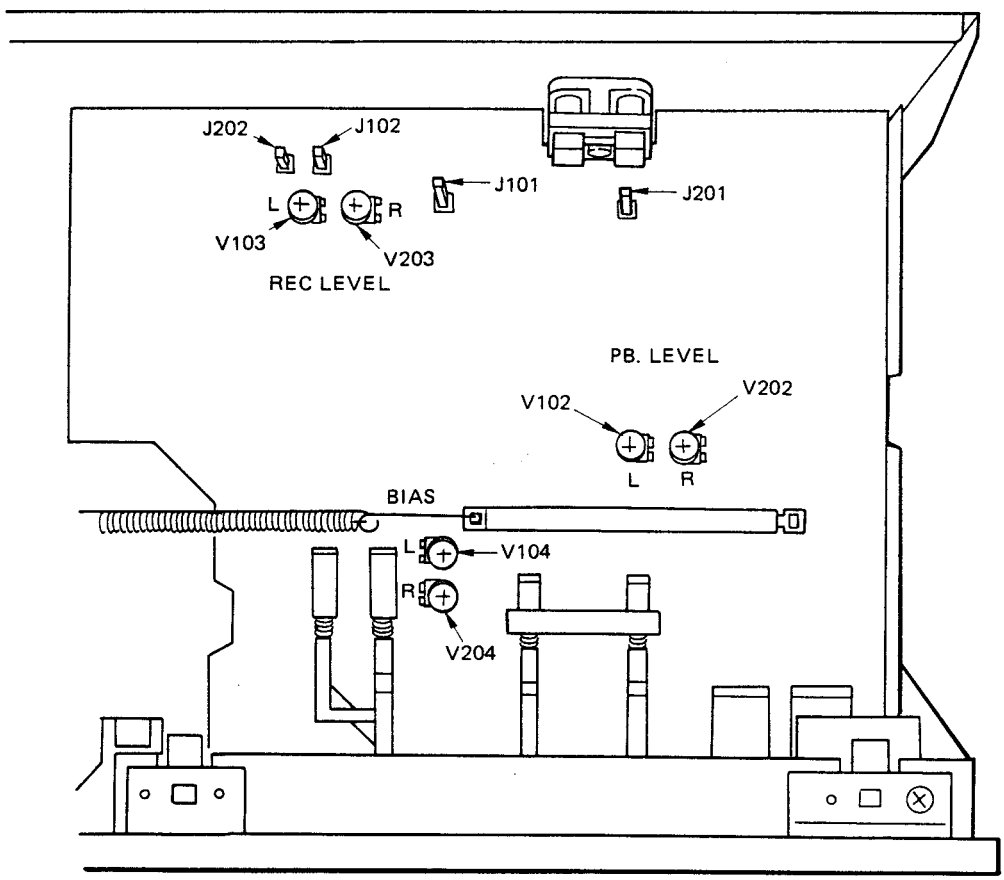


Fig. 11-8 Emplacements des dispositifs de réglage

3. Réglage du niveau de lecture
• Ce reglage servant à étalonner le niveau DOLBY NR doit être executé avec un grand soin

	Mode	Signal appliqué et bande d'étalonnage	Emplacement du reglage	Emplacement de la borne de mesure	Valeur relevée	Observations
1	ARRET	Placer le selecteur de bande (TAPE SELECTOR) en position "NORM"				
2	LECTURE	Lire le passage preenregistre de 315kHz/0dB de la bande d'etalonnage STD-331B.	V102 (canal gauche) V202 (canal droit)	J101 (canal gauche) J201 (canal droit)	−7,7dBv (412,1mV)	

4. Contrôle de fonctionnement des décibelmètres

	Mode	Signal appliqué et bande d'étalonnage	Emplacement du réglage	Emplacement de la borne de mesure	Valeur relevée	Observations
1	PAUSE À L'ENREGISTREMENT	Injecteur un signal de 315Hz/−10dBv (316mV) per les bornes d'entree de ligne "LINE INPUT".	Potentiometre de reglage de niveau d'enregistrement "REC LEVEL".	Bornes de sortie droite et gauch "OUTPUT".	Vérifier si les décibelmètres "0dB" s'allument sous un niveau de sortie de signal de −10dBv±1,8dB.	

5. Calage de réponse en fréquence d'enregistrement et de lecture

	Mode	Signal appliqué et bande d'étalonnage	Emplacement du réglage	Emplacement de la borne de mesure	Valeur relevée	Observations
1	ARRÊT	Placer le sélecteur de bande (TAPE SELECTOR) en position "NORM".				
2	PAUSE À L'ENREGISTREMENT	Injecter un signal de 315Hz/−30dBv (31,6mV) per les bornes d'entrée de ligne "LINE INPUT".	Potentiomètre de réglage de niveau d'enregistrement "REC LEVEL".	Bornes de sortie droite et gauche "OUTPUT".	−30dBv (31,6mV)	
3	ENREGISTREMENT/ LECTURE	Enregistrer le niveau de signal indiqué plus haut sur la bande d'étalonnage STD-608A à 315Hz et 6,3kHz et lire ce passage.	V104 (canal gauche) V204 (canal droit)	Bornes de sortie droite et gauche "OUTPUT".	Ajuster le niveau de lecture du signal 6,3kHz à +0 dB ou au-dessus puis le niveau de 315Hz.	
4		Enregistrer le lire le signal jusqu'à 12kHz sur la bande d'étalonnage STD-608A et contrôler si la zone de réponse en fréquence admissible qui est représentée sur la courbe de la figure 11-9 est satisfaite. Si la courbe de fréquence représentée n'est pas atteinte, modifier la valeur du réglage de l'opération 3 dans les limites de $^{+1}_{0.5}$dB et refaire le réglage indiqué dans l'opération 3.				
5		Régler le commutateur DOLBY NR en position ON. Enregistrer et lire les signaux jusqu'à 10kHz sur la bande d'étalonnage STD-608A et contrôler si la zone de réponse en fréquence admissible qui est représentée sur la courbe de la figure 11-9 est satisfaite(pour DOLBY NR B et C).				
6		Placer le sélecteur de bande (TAPE SELECTOR) en position "CrO_2". Enregistrer et lire les signaux jusqu'à 12kHz sur la bande d'étalonnage STD-603 et contrôler si la zone de réponse en fréquence admissible qui est représentée sur la courbe de la figure 11-10 est satisfaite (lorsque le commutateur DOLBY NR est en position OFF, B et C).				
7		Placer le sélecteur de bande (TAPE SELECTOR) en position "METAL". Enregistrer et lire les signaux jusqu'à 12kHz sur la bande d'étalonnage STD-610 et contrôler si la zone de réponse en fréquence admissible qui est représentée sur la courbe de la figure 11-11 est satisfaite (lorsque le commutateur DOLBY NR est en position OFF, B et C).				

6. Réglage du niveau d'enregistrement

	Mode	Signal appliqué et bande d'étalonnage	Emplacement du réglage	Emplacement de la borne de mesure	Valeur relevée	Observations
1	ARRÊT	Placer le sélecteur de bande (TAPE SELECTOR) en position "NORM".				
2	PAUSE À L'ENREGISTREMENT	Injecter un signal de 315Hz/−10dBv (316mV) par les bornes d'entrée de ligne "LINE INPUT".	Potentiomètre de réglage de niveau d'enregistrement "REC LEVEL".	J101 (canal gauche) J201 (canal droit)	−7,7dBv (412,1mV)	
3		Régler le commutateur DOLBY NR en position ON.				
4	ENREGISTREMENT/ LECTURE	Enregistrer le niveau de signal indiqué plus haut sur la bande d'étalonnage STD-608A et lire ce passage.	V103 (canal gauche) V203 (canal droit)	J101 (canal gauche) J201 (canal droit)	−7,7dBv (412,1mV)	
5		Placer le sélecteur de bande (TAPE SELECTOR) en position "CrO_2".				
6		Enregistrer le niveau de signal indiqué plus haut sur la bande d'étalonnage STD-603 et lire ce passage.	Contrôler	J101 (canal gauche) J201 (canal droit)	−7,7dBv±1,5dB	
7		Placer le sélecteur de bande (TAPE SELECTOR) en position "METAL".				
8		Enregistrer le niveau de signal indiqué plus haut sur la bande d'étalonnage STD-610 et lire ce passage.	Contrôler	J101 (canal gauche) J201 (canal droit)	−7,7dBv±1,5dB	

Barde d'étalonnage: STD-608A
Tape selector: NORM

DOLBY NR: OFF (arrêt)	DOLBY NR: TYPE B ON (marche)	DOLBY NR: TYPE C ON (marche)

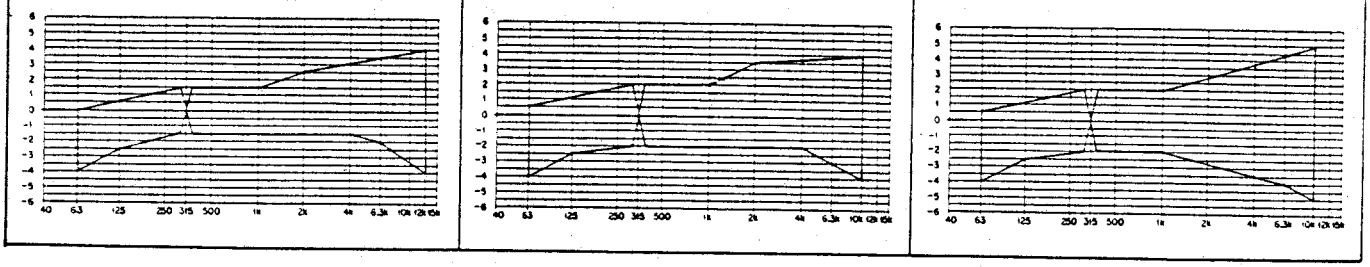


Fig. 11-9 Zone de réponse en fréquence admissible de lecture et d'enregistrement (NORM)

Barde d'étalonnage: STD-603
Tape selector: CrO_2

DOLBY NR: OFF (arrêt)	DOLBY NR: TYPE B ON (marche)	DOLBY NR: TYPE C ON (marche)

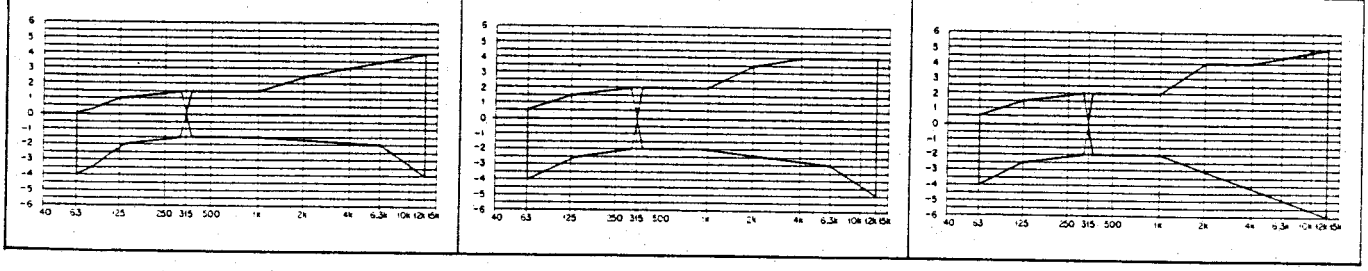


Fig. 11-10 Zone de réponse en fréquence adissible de lecture et d'enregistrement (CrO_2)

Barde d'étalonnage: STD-610
Tape selector: METAL

DOLBY NR: OFF (arrêt)	DOLBY NR: TYPE B ON (marche)	DOLBY NR: TYPE C ON (marche)

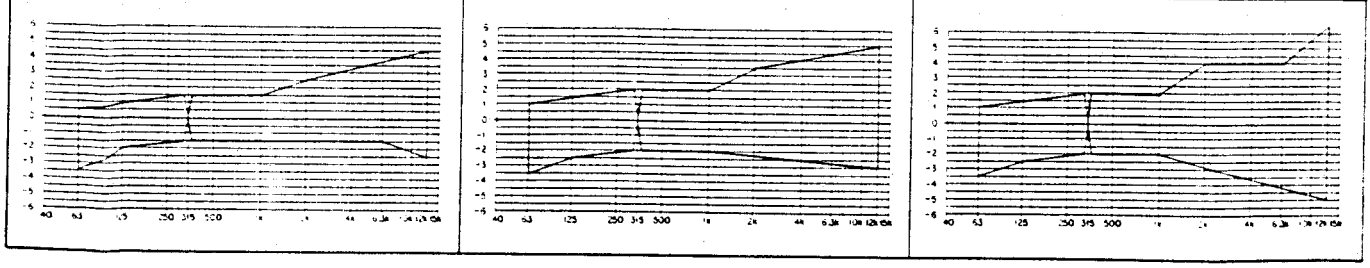


Fig. 11-11 Zone de réponse en fréquence adissible de lecture et dénregistrement (METAL)

11. AJUSTE

11.1 AJUSTES MECANICOS

Antes del ajuste

Limpiar ambas bases de los carretes, el eje de arrastre y el rodillo de presión con algodón remojado en alcohol.

Ajuste de la presión del rodillo de presión

1. Establecer el magnetófono en el modo de reproducción.
2. Con el calibrador de tensión, presionar ligeramente contra el brazo del rodillo de presión y separar un poco dicho rodillo del eje de arrastre.
3. Luego reponer el rodillo de presión sobre el eje de arrastre, y leer el valor en el momento que el rodillo de presión empieza a girar. Si la indicación no está dentro de 300~500g, reemplazar el muelle del rodillo de presión.

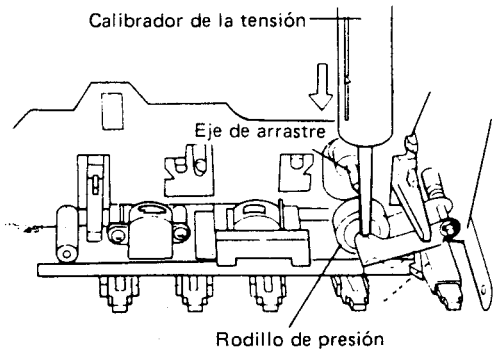


Fig. 11-1 Ajuste de la presión del rodillo de presión

Ajuste de la torsión de la base del carrete

Utilizar el medidor de torsión para medir la torsión durante las funciones de reproducción, avance rápido (FF) y rebobinado (REW). Los valores obtenidos deben estar normalmente dentro de los límites permisibles enumerados en la tabla 1.

Si los valores obtenidos no están dentro de tales límites, reemplazar el conjunto de la base del carrete tensor (TU) y/o el conjunto de la base del carrete de suministro, la rueda de guía TU, o todo el conjunto del brazo de arrastre.

Tabla 1

	Base del carrete TU	Base del carrete de suministro
Modo de reproducción	38 – 57g.cm	*1,5 – 5g.cm
Modo de avance rápido	75 – 135g.cm	*1,5 – 5g.cm
Modo de rebobinado	1,5 – 15g.cm	75 – 135g.cm

* *Indica par de torsión de contratensión.*

Ajuste de la velocidad de la cinta

1. Conectar el frecuentímetro a los terminales de salida de línea (LINE OUTPUT).
2. Reproducir la parte de 3kHz de la cinta de prueba STD-301. Al principio, la frecuencia deberá estar entre 3000Hz~3010Hz, y podrá ajustarse girando el resistor semifijo ubicado en el orificio de ajuste del motor, como se muestra en la Fig. 11-2.

NOTA:
La velocidad de la cinta aumentará al girar a la derecha el resistor semifijo, y se reducirá al giarlo a la izquierda.

Ajuste del interruptor de grabación (REC)

1. Presionar el botón REC. La palanca de accionamiento de REC se mueve en la dirección Ⓐ. En este momento, comprobar que el interrutor REC está en la posición ON.
2. Presionar el botón de parada (STOP). La palanca de accionamiento de REC se mueve ligeramente en la dirección Ⓑ. Entonces, doblar y ajustar la palanca de accionamiento de REC de modo que la distancia de contacto del interruptor REC sea de 0,2~0,5mm.

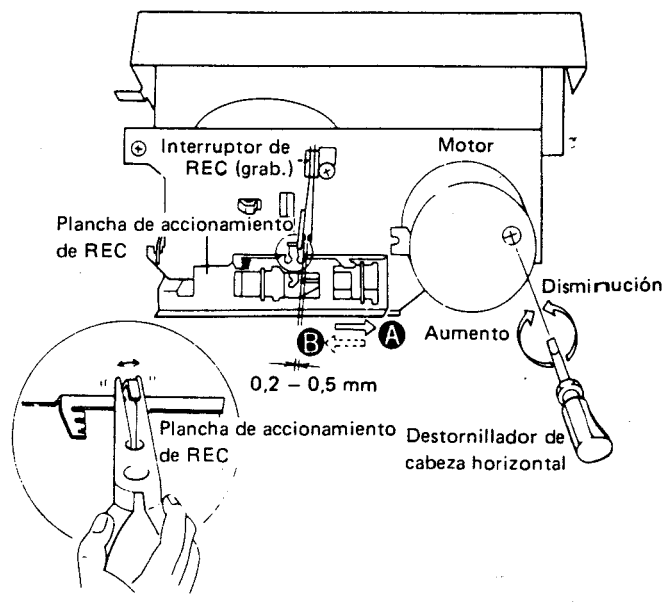


Fig. 11-2 Ajuste de la velocidad de la cinta y del interruptor de grabación (REC)

Comprobación y ajuste del amortiguamiento de la puerta

1. Presionar el botón de expulsión (EJECT) sin haber ningún casete insertado en el compartimiento del casete, y comprobar que la puerta se abre suavemente sin movimientos interrumpidos ni rebote después de haberse abierto por completo.
2. Si no se satisfacen estas condiciones, ajustar girando el tornillo de ajuste del cabezal del cilindro.

Girar el tornillo hacia la izquierda si la puerta se abre con interrupciones en dos etapas.

Girar el tornillo hacia la derecha si la puerta rebota después de haberse abierto por completo.

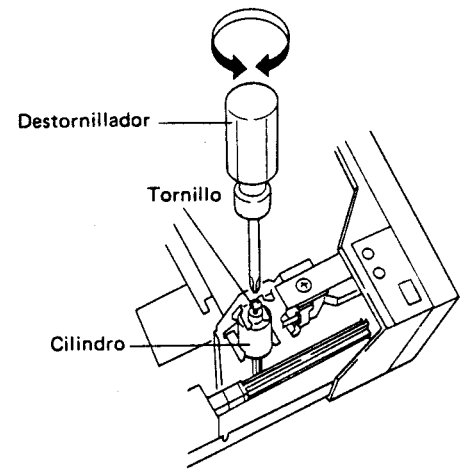


Fig. 11-3 Comprobacion y ajuste del amortiguamiento de la puerta

Comprobación y ajuste de la unión de grabación REC

1. Comprobar que el entrehierro F entre la unión REC y el conmutador deslizante es de 0 a 0,3 mm cuando el mecanismo de transporte está detenido (y comprobar que no se mueve el conmutador deslizante).
2. Mover la posición de engrane del mecanismo de unión REC hacia atrás si el entrehierro F es mayor a 1mm, y moverla hacia adelante si no hay entrehierro y se mueve el conmutador deslizante.
3. Si el entrehierro F descrito no puede obtenerse mediante el ajuste mencionado, doblar la sección de gancho de la unión REC con un alicates.
4. Comprobar que el conmutador deslizante está completamente conmutado cuando el mecanismo de transporte está en el modo de grabación.
5. Comprobar tambień que el interruptor de muelle del mecanismo está cortocircuitado.

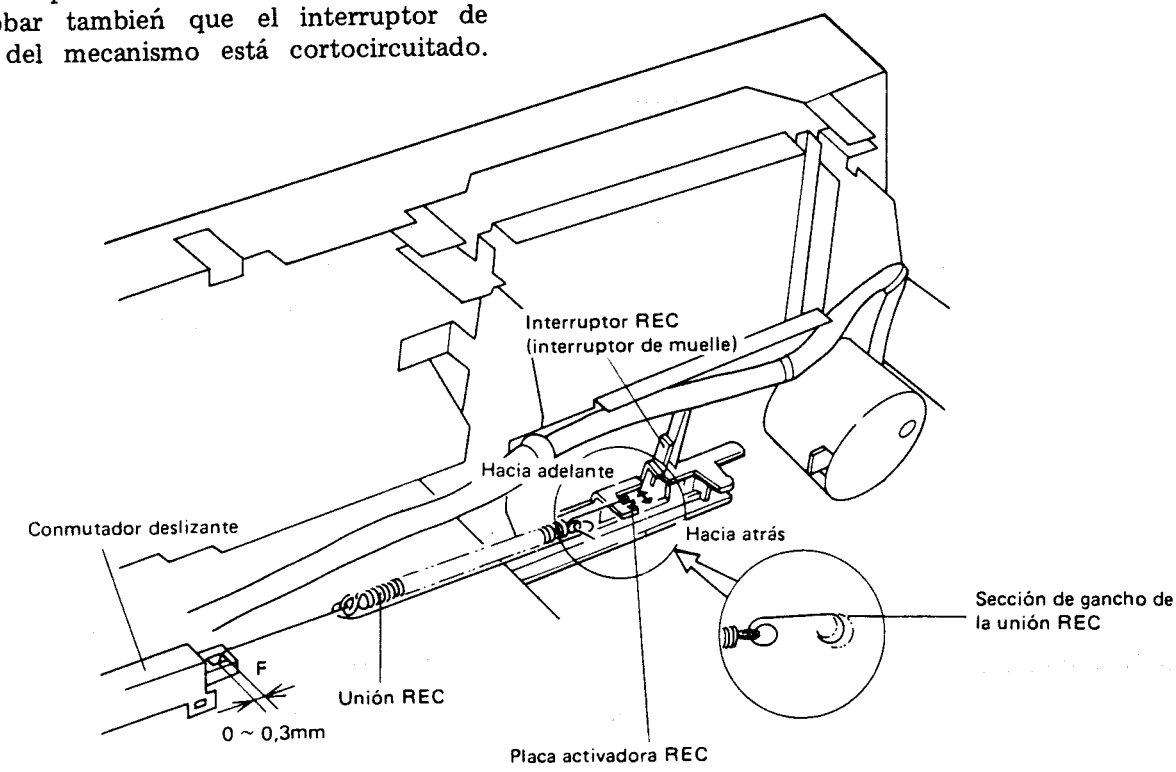


Fig. 11-4 Comprobacion y ajuste de la union de grabacion

11.2 AJUSTES ELECTRICOS

Condiciones de ajuste

1. Los ajustes mecánicos deben terminarse primero.
2. Limpiar y desimanar la cabeza de grabación.
3. Dejar que el magnetófono se precaliente por unos minutos antes de iniciar los ajustes eléctricos.
4. La señal de referencia es de 0dB=1Vrms.
5. Conectar una resistancia de carga de 50 kilo-ohmios (o entre 47 y 52 kilo-ohmios) a los terminales de salida (OUTPUT).
6. A menos que se especifique de otra manera, los siguientes interruptores deben estar en las posiciones indicadas:
   DOLBY NR : OFF
   SELECTOR DE CINTA : NORM

Cintas de prueba

STD-331B : Para ajustes de reproducción (Referirse a la Fig. 11-5)
STD-608A : Cinta NORMAL en blanco.
STD-603 : Cinta CrO_2 en blanco.
STD-610 : Cinta de METAL en blanco.

Lista de ajustes y comprobaciones

1 Ajuste azimutal de la cabeza de grabación
2. Comprobación del ecualizador de reproducción
3. Ajuste del nivel de reproducción
4. Comprobación del indicador de nivel de grabación
5. Ajuste de la respucsta de frecuencia de grabación y reproducción
6. Ajuste del nivel de grabación

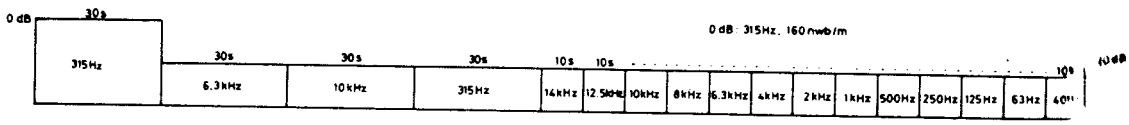


Fig. 11-5 Contenido de la cinta de prueba STD-331B

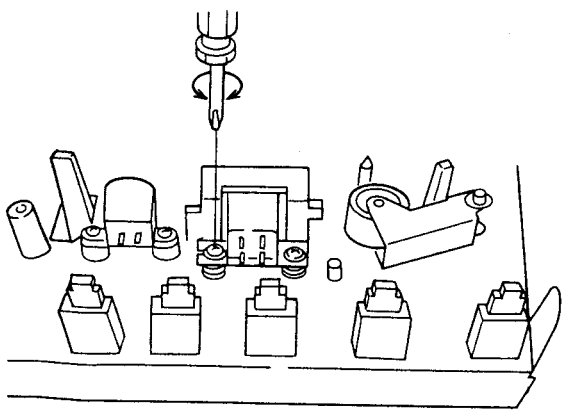


Fig. 11-6 Ajuste azimutal de la cabeza de grabación

Cinta de de prueba	STD-331B
Selector de cinta	NORM
Interruptor DOLBY NR	OFF

• La señal del canal derecho se compensa en ... desde los valores reales de 40Hz y 63Hz.

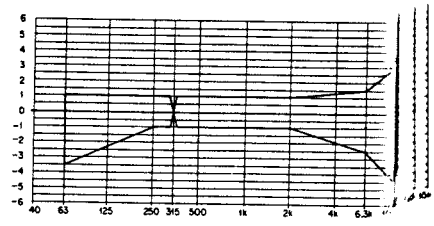


Fig. 11-7 Zona de respuesta de frecuencia de reproducción permisible

- Poner el interruptor DOLBY NR en la posición OFF.

1. Ajuste azimutal de la cabeza de grabación

- Girar V101 y V201 a la posición máxima (completamente a la derecha)

	Modo	Señal de entrada y cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	Parada (STOP)	Regular el interruptor selector de cinta (TAPE SELECTOR) a la posición NORM.				
2	Reproducción (PLAY)	Reproducir la parte de 10kHz/–20dB de la cinta de prueba STD-331B.	Tornillo de ajuste azimutal de la cabeza de reproducción. (Referirse a la Fig. 11-6)	Terminales de salida (OUTPUT) derecho e izquierdo.	Nivel máximo de la señal de reproducción.	
3	Parada (STOP)	Dejar trabado el tornillo después de terminar el ajuste.				

2. Comprobación del ecualizador de reproducción.

	Modo	Señal de entrada y cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	Parada (STOP)	Regular el interruptor selector de cinta (TAPE SELECTOR) a la posición NORM.				
2	Reproducción (PLAY)	Reproducir las partes de 315Hz/–20dB y 6,3kHz/–20dB de la cinta de prueba STD-331B.	Confirmación	Terminales de salida (OUTPUT) derecho e izquierdo.	El nivel de reproducción de 6,3kHz es de –0,5±2dB con relación al nivel de 315Hz.	
3	Parada (STOP)	Regular el interruptor selector de cinta (TAPE SELECTOR) a la posición CrO_2 o METAL.				
4	Reproducción (PLAY)	Reproducir las partes de 315Hz/–20dB y 6,3kHz/–20dB de la cinta de prueba STD-331B.	Confirmación	Terminales de salida (OUTPUT) derecho e izquierdo.	El nivel de reproducción de 6,3kHz es de –4,5±2dB con relación a al nivel de 315Hz.	

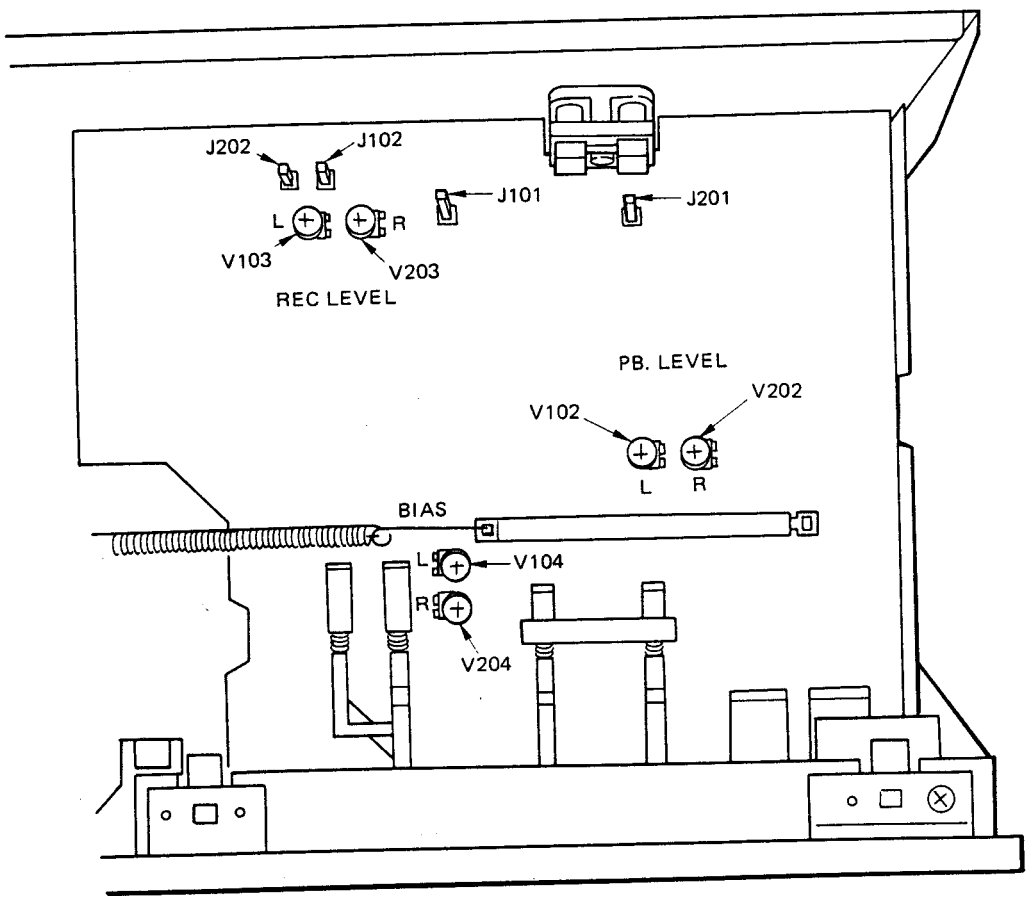


Fig. 11-8 Puntos de ajuste

3. Ajuste del nivel de reproducción

• Este ajuste determina el nivel DOLBY NR, y debe efectuarse con sumo cuidado.

	Modo	Señal de entrada y cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	Parada (STOP)	Regular el interruptor selector de cinta (TAPE SELECTOR) a la posición NORM.				
2	Reproducción (PLAY)	Reproduce la parte de 315Hz/ 0dB de la cinta de prueba STD-331B.	V102 (Canal izquierdo) V202 (Canal derecho)	J101 (Canal izq.) J201 (Canal der.)	−7,7dBv (412,1mV)	

4. Comprobación del indicador de nivel

	Modo	Señal de entrada y cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	Grabación/ pausa (REC/ PAUSE)	Aplicar una señal de 315Hz/ −10dBv (316mV) a los terminales de entrada de línea (LINE INPUT).	Control del nivel de grabación. (REC LEVEL)	Terminales de salida (OUTPUT) derecho e izquierdo.	Comprobar que los indicadores de nivel "0dB" se encienden dentro de −10dBv±1,8dB del nivel de señal de salida.	

5. Ajuste de la respuesta de frecuencia de grabación y reproducción.

	Modo	Señal de entrada y cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	Parada (STOP)	Regular el interruptor selector de cinta (TAPE SELECTOR) a la posición NORM.				
2	Grabación/ pausa (REC/ PAUSE)	Aplicar una señal de 315Hz/ −30dBv (31,6mV) a los terminales de entrada de línea (LINE INPUT).	Control de nivel de grabación (REC LEVEL).	Terminales de salida (OUTPUT) derecho e izquierdo.	−30dBv (31,6mV)	
3	Grabación/ reproducción (REC/ PLAY)	Grabar el nivel de señal en la cinta de prueba STD-608A a 315Hz y 6,3kHz, y reproducir.	V104 (Canal izquierdo) V204 (Canal derecho)	Terminales de salida (OUTPUT) derecho e izquierdo.	Ajustar el nivel de reproducción de la parte 6,3kHz a +0dB mayor y luego el nivel de 315Hz.	
4		Grabar y reproducir la señal hasta de 12kHz en la cinta de prueba STD-608A, y comprobar que la zona de respuesta de frecuencia permisible está de acuerdo con lo indicado en la Fig. 11-9. En caso contrario, cambiar el valor de ajuste del procedimiento 3 dentro de $^{+1}_{-0.5}$dB y reajustar el valor del procedimiento 3.				
5		Regular el interruptor DOLBY NR a la posición ON. Grabar y reproducir las señales de hasta 10kHz en la cinta de prueba STD-608A, y comprobar que la zona de respuesta de frecuencia permisible está de acuerdo con la mostrada en la Fig. 11-9 (para DOLBY NR B y C).				
6		Regular el interruptor selector de cinta (TAPE SELECTOR) a la posición CrO_2. Grabar y reproducir las señales de hasta 12kHz en la cinta de prueba STD-603, y comprobar que la zona de respuesta de frecuencia permisible está de acuerdo con la mostrada en la Fig. 11-10 (para DOLBY NR OFF, B y C).				
7		Regular el interruptor selector de cinta (TAPE SELECTOR) a la posición METAL. Grabar y reproducir las señales hasta de 12kHz en la cinta de prueba STD-610, y comprobar que la zona de respuesta de frecuencia permisible está de acuerdo con la mostrada en la Fig. 11-11 (para DOLBY NR OFF, B y C).				

6. Ajuste del nivel de grabación

	Modo	Señal de entrada y cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	Parada (STOP)	Regular el interruptor selector de cinta (TAPE SELECTOR) a la posición NORM.				
2	Grabación/ pause (REC/ PAUSE)	Aplicar una señal de 315Hz/ −10dBv (316mV) a los terminales de entrada de línea (LINE INPUT).	Control de nivel de grabación (REC LEVEL)	J101 (Canal izq.) J201 (Canal der.)	−7,7dBv (412,1mV)	
3		Regular el interruptor DOLBY NR a la posición ON.				
4	Grabacion/ reproducción (REC/ PLAY)	Grabar el nivel de señal en la cinta de prueba STD-608A, y reproducir.	V103 (Canal izquierdo) V203 (Canal derecho)	J101 (Canal izq.) J201 (Canal der.)	−7,7dBv (412,1mV)	
5		Regular el interruptor selector de cinta (TAPE SELECTOR) a la posición CrO_2.				
6		Grabar la señal en la cinta de prueba STD-603, y reproducir.	Confirmación	J101 (Canal izq.) J201 (Canal der.)	−7,7dBv±1,5dB	
7		Reguler el interruptor selector de cinta (TAPE SELECTOR) a la posición METAL.				
8		Grabar la señal en la cinta de prueba STD-610, y reproducir.	Confirmación	J101 (Canal izq.) J201 (Canal der.)	−7,7dBv±1,5dB	

Cinta de prueba: STD-608A
Selector de cinta: NORM

DOLBY NR: OFF	DOLBY NR: TIPO B ON	DOLBY NR: TIPO C ON

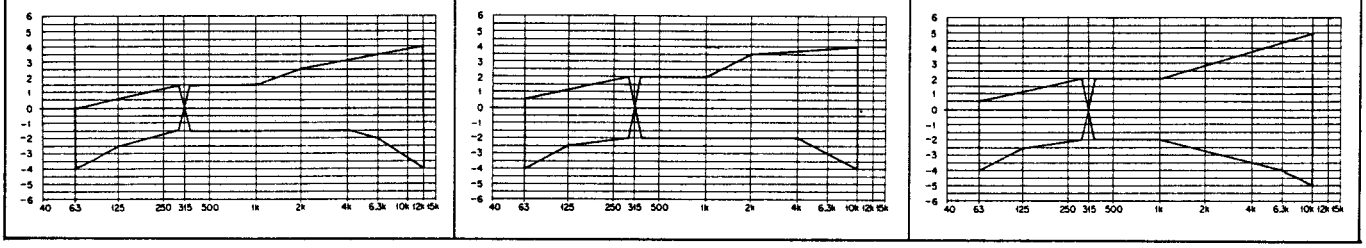


Fig. 11-9 Zona de respuesta de frecuencia de grabación y reproducción permisible (NORM)

Cinta de prueba: STD-603
Selector de cinta: CrO_2

DOLBY NR: OFF	DOLBY NR: TIPO B ON	DOLBY NR: TIPO C ON

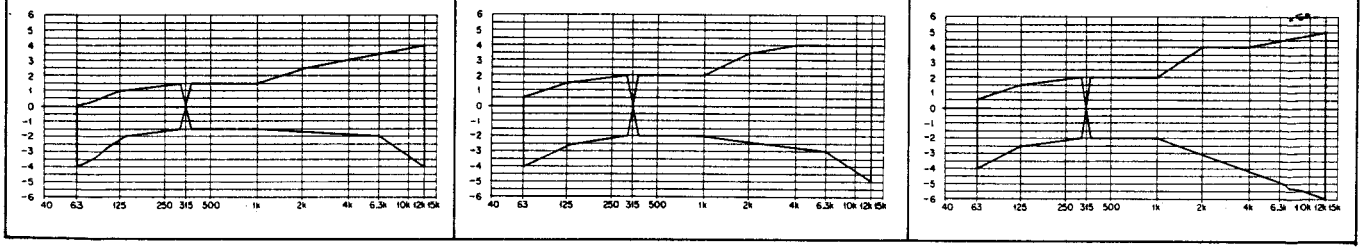


Fig. 11-10 Zona de respuesta de frecuencia de grabación y reproducción permisible (CrO_2)

Cinta de prueba: STD-610
Selector de cinta: METAL

DOLBY NR: OFF	DOLBY NR: TIPO B ON	DOLBY NR: TIPO C ON

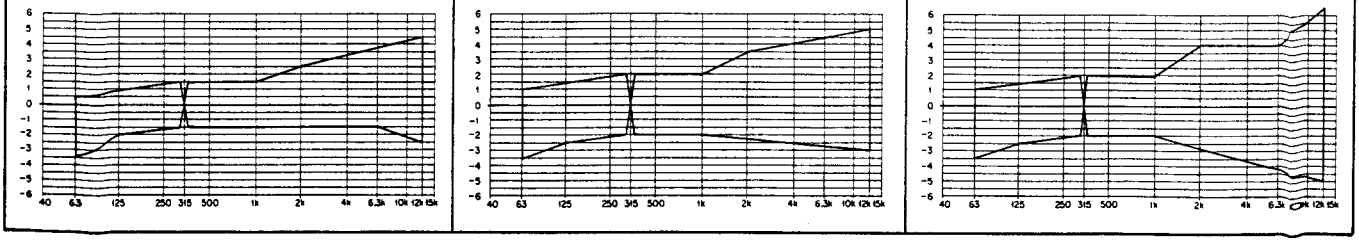


Fig. 11-11 Zona de respuesta de frecuencia de grabación y reproduccion permisible (METAL)

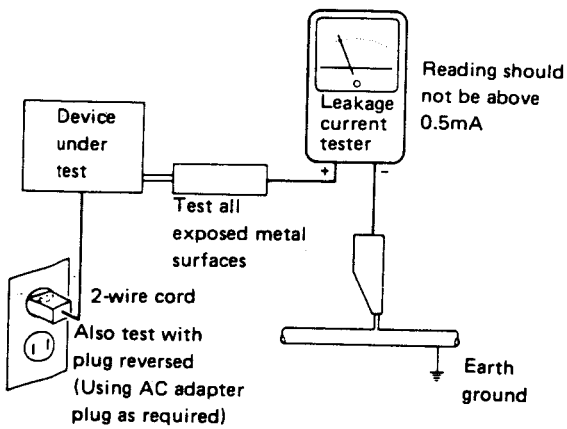
12. SAFETY INFORMATION

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.


Device under test
Leakage current tester
Reading should not be above 0.5mA
Test all exposed metal surfaces
2-wire cord
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.

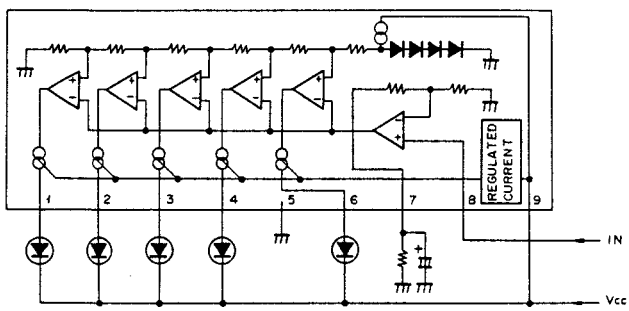
The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

13. IC DATA

BA6124

Block Diagram



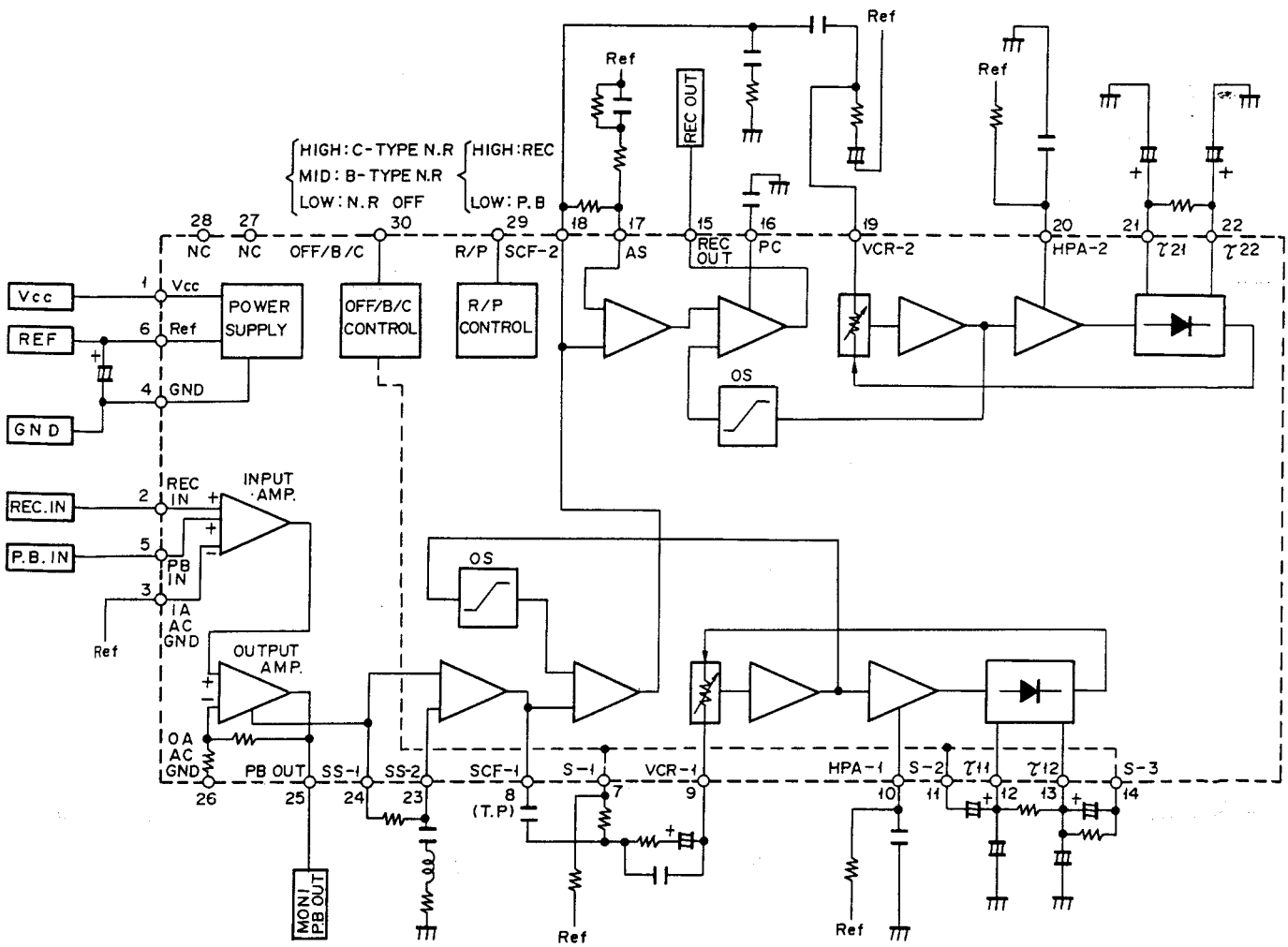
Pin Description

- 5-dot LED VU level meter drive

Pin No.	Pin Name	Description
1	D1	LED drive output (1st)
2	D2	LED drive output (2nd)
3	D3	LED drive output (3rd)
4	D4	LED drive output (4th)
5	GND	Ground
6	D5	LED drive output (5th)
7	AMP OUT	Preamp output
8	IN	Input
9	Vcc	DC power

HA12058NT

Block Diagram



Pin Description

- Dolby B/C noise reduction system

Pin No.	Pin Name	Description
1	Vcc	DC power.
2	REC IN	Recording system signal input.
3	IA AC GND	Input amp inversion input.
4	GND	Ground.
5	PB IN	Playback system signal input.
6	REF	Reference pin.
7	S-1	High level stage side chain filter selector switch.
8	SCF-1	High level stage side chain filter terminal.
9	VCR-1	High level stage VCR terminal.
10	HPA-1	High level stage high-pass amp output.
11	S-2	Time constant selector switch.
12	T11	Time constant terminal.
13	T12	
14	S-3	Time constant selector switch.
15	REC OUT	Encoder output.
16	P.C.	Phase compensation capacitor.
17	AS	Anti-saturation network.
18	SCF-2	Low level stage side chain filter terminal.
19	VCR-2	Low level stage VCR terminal.
20	HPA-2	Low level stage high-pass amp output.
21	T21	Low level stage time constant terminal.
22	T22	
23	SS2	Spectrum skewing terminal.
24	SS-1	
25	PB OUT	Monitor & decoder output.
26	OA AC GND	Output amp invert input.
27	NC	(Open)
28	NC	(Open)
29	R/P	Recording/playback selector. H (3.5–6.0V): REC, L (0–1.0V): PLAY.
30	OFF/B/C	Noise reduction switch. H (11–14V): C-type, M (7.4–7.8V): B-type, L (0–3.0V): OFF

14.SUPPLEMENT FOR CT-450/HEM, HB

- Models CT-450/HEM (European continent model) and CT-450/HB (United Kingdom model) are the same as the CT-450/KU (U.S.A. model) with the exception of this supplement.

Contrast of Miscellaneous Parts

Mark	Symbol & Description	Part No. KU type	Part No. HEM type	Part No. HB type	Remarks
⚠ ★	T1 Power transformer (120V)	RTT-373	.....	.....	
	Power transformer (220/240V)	.....	RTT-375	RTT-375	
⚠ ★★	FU1 Fuse (T630mA)	.....	REK-061	REK-061	
⚠	AC power cord	RDG-048	RDG-053	RDG-052	
⚠	Strain relief (for AC power cord)	REC-395	REC-396	REC-396	
⚠	Power supply assembly	Non supply	Non supply	Non supply	C401, FU1
	Operating instructions				
	(English)	RRB-240	.....	RRB-240	
	(English/German/French/Italian)	.....	RRE-067	.....	
	Packing case	RHG-720	RHG-725	RHG-725	

Power Supply Assembly

- Power supply assembly for HEM and HB types is the same as the Power supply assembly for KU type with the exception of following sections:

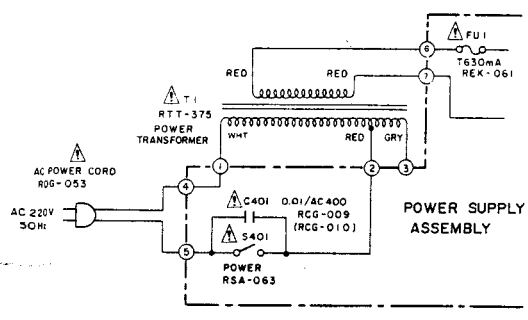
Symbol & Description	for KU type	for HEM & HB types
⚠ C401 Ceramic capacitor	RCG-008 (0.01/AC250V)	RCG-009 (0.01/AC400V)
⚠ Fuse clip (for FU1)	.....	Non supply

Main Assembly

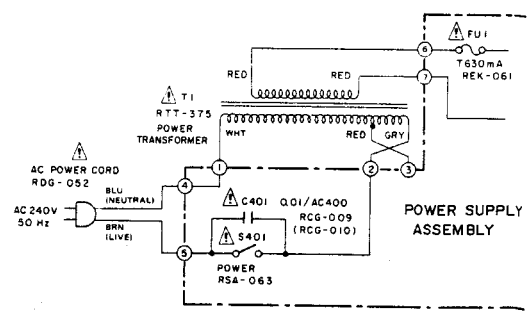
- Main assembly for HEM and HB types is the same as the Main assembly for KU type with the exception of following sections:

Symbol & Description	for KU type	for HEM & HB types
⚠ R328 Metal oxide film resistor	RS1LF 181J	RS1LF 271J

Power Supply Circuit for HEM Type



Power Supply Circuit for HB Type



Power Supply Assembly for HEM and HB Types